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ABSTRACT

One of three related documents produced in response to a need for direct instruction in thinking skills at the secondary level, this program for high school students bases its approach on involvement of students in direct experiences. Designed to build on the thinking skills that the student already possesses and, ideally, on the experience gained in Book One, it provides training in analytical skills as well as systematic development of intuitive skills. In the first unit, students explore perception and the way the mind guides, focuses, and organizes perception, and they begin to reflect on their own thought processes. In the second unit, three kinds of relationships and connections are explored: comparisons (especially metaphor and analogy), whole/part relationships, and the creation of new relationships. The third unit directs students in learning to distinguish between scientific problems and interpersonal problems and to improve their problem-solving skills with both types of problems. The fourth unit directs students to explore the creative aspects of the thinking process by reading about the experience of creation from creative thinkers and to stimulate their own creative powers by using activities based on research. (EL)

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orchard. My apple trees will never get across And eat the cones under his pines, I tell him. He only says, "Good fences make good ne

s and free throw, but Lee Madison rebounded and laid it in for a 68-64 lead. A basket by Alvarez closed the scoring. Houston

Soviet ambassador sped toward West Germany, "the Russians acted immediately. Moscow was alerted and, within seconds, on a d

sically styled hooded jacket in a cotton polyester blend that is wind-resistant and water-repellent. Features include flapped pockets, ragla

MANAGER: "Thank you. Thank you! That'll do. We'll have to interrupt again here. Thank you, Mrs. Webb; thank you, Emil

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Thinking through Language

Book Two

CS 209223

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Thinking through Language

Book Two

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Introduction: Thinking for Survival

Thousands of years ago, tiny scattered bands of human beings shared the planet with tigers, rhinoceroses, baboons, and mammoths. With no natural weapons and no advantage of size or speed, the human species must have looked like a good, quick meal for the saber-toothed tiger. Yet humans have survived, while the saber-toothed tiger and the woolly rhinoceros have become extinct. We have survived for one main reason—we possess the ability to think and to solve problems in an original way. Thinking skills are far more important for survival than strength, speed, or ferocious claws.

Today we humans still face threats to our survival. Today's threats, however, are very different from the threats faced by our cave ancestors. Instead of facing fierce beasts, you as adults will have adventures meeting the challenges of computerized jobs in a global economy. Instead of having to protect yourself and your family from predators, you will have to work with everyone else on the planet to prevent nuclear war, environmental deterioration, and exhaustion of our natural resources.

Using This Book

Improving your thinking skills so that you can better meet these challenges is the goal of this book. Like all skills, thinking skills are improved by practicing, by analyzing your performance for successes

and failures, and by learning new strategies. In this book you will find a series of activities that will challenge your thinking skills. After each activity or group of activities, you will have a *Reflection* exercise in which you will be asked to examine and think about your performance. The Reflection exercises are much like the process athletes use to improve their performance by looking at a videotape to see what they did well and where they could improve. Learning to examine your own performance will help you to continue to improve thinking skills after you complete this course.

You should keep all of the Reflection exercises in a notebook, journal, or diary. When you complete the course, this record will not only document your progress but will also provide you with a picture of your unique mind, your talents, and your weaknesses.

Sometimes you will be introduced to thinking strategies that others have found successful. These are not "the only right way" of doing things. The kinds of skills you will develop in this book do not have a single right way and a single wrong way, just as there is no one right way or wrong way to win a game.

There are strategies, however, that often work—and there are some that almost never work. You can learn and use the strategies suggested in the same way an athlete uses specific strategies. Choose those that complement your own personal strengths and apply them when they seem appropriate.

At the end of most lessons will be suggestions of situations in which you can apply the kind of thinking skills you have worked with in that lesson.

ACCURATE perception of the world around you is often a matter of life and death. Misperceiving the distance from a car coming toward you, misreading the label on a bottle in the medicine cabinet, or assuming that a rattlesnake is just a stick could lead to injury or even death. Even when you are not in life-threatening situations, accurate perception can make the difference between success and failure. Correctly interpreting the tone of your mother's voice can make the difference between a fight and a pleasant day. Perceiving very minor differences in pitch makes the difference between playing in tune or ruining the sound of the whole band.

Skillful and accurate use of the senses is important in every career and is the foundation for all thinking processes. Perception gives you information about the world. If you start out with the wrong information, your other thinking skills may not do you much good.

Unfortunately, your senses are not foolproof. In fact, as magicians know, it is quite easy to fool most people's eyes, ears, and noses. People also tend to see what they want to see and avoid seeing things that threaten them.

In this chapter you will learn not only to use your senses more effectively, but also to recognize and overcome many of the problems that can distort your perceptions. Our minds influence our perceptions. Part of the process of thinking is directing our senses, and sorting out and interpreting impressions.

Perception

LESSON 1: Observing the World and Your Mind

When you look at the world, you probably assume that you see the same thing everyone else sees. That is not, however, completely true. Your senses are directed by your mind, and your mind can influence what you perceive in many ways. In this lesson you will begin to see the way that your mind directs your perceptions. You will discover some of the unique abilities of your mind and will learn some ways of perceiving the world more effectively.

ACTIVITY:

Observing Your Surroundings

ON YOUR OWN

Use your senses to observe what is around you at the present moment. For three minutes, make a list of all of the things you perceive around you. Write down everything you notice in the classroom. Do not use only your eyes. Use your ears, nose, and fingers as well.

IN A GROUP

At the end of three minutes, pull your chairs together into groups of four or five students each. Quickly select a leader who will read the following questions aloud and direct the discussion and a recorder who will summarize your group's conclusions.

1. What differences are there among the observations? What things did everyone notice? What did only one person notice?
2. How many people mentioned each of the following: people, clothing style, furniture, colors, smells, sounds, overall shape and dimensions of the room, tiny details, numbers? How many people listed things all in the same category (all furniture, all colors, etc.)? How many listed things from a wide variety of categories?
3. How would you explain the differences in the things that people listed? Do you think people are born sensing different kinds of things or do they *learn* to focus on different things? Can you think of any

previous experiences or lessons that influenced the way you observed the room?

Reflection: This will be your first entry in your reflection journal. If you have not read about the reflection journal, turn back to the introduction on page 1 and read the section entitled "Using This Book."

For your first entry in your reflection journal, you will be looking at the way your mind perceives the world. Divide the page into two columns. In the first column, list the things that you sensed that most other people did not notice. In the second column, list some of the things that others wrote that you did not notice. Now look at your two columns. Write a paragraph reflecting on the way you perceive the world. If you do not immediately have ideas to write, you might think about some of the following questions:

1. Were you aware of choosing things to list, or did you try listing everything?
2. Would you like to improve your observation ability?
3. Did your pattern of observing fit your interests or your personality in any way?

ACTIVITY:

Learning to Focus

Our senses are always taking in so much information that our minds would be overwhelmed if we noticed everything in our surroundings all of the time. We all learn that certain things are probably irrelevant and not worth noticing. We learn to ignore the noises of furnaces and plumbing, the feel of our desks, and the sight of the room around us. As students in a classroom, we learn to focus our attention on a book, the chalkboard, or the teacher's voice.

As you continue in school, you will probably learn to focus even more narrowly. You will eventually specialize in a certain career, and one of the most important aspects of specializing is training your senses to focus on the aspects of the environment that are important to your task or career. For example, the following paragraphs describe things that an environmental design specialist would be trained to observe about the lighting in a room. Read the paragraphs and then list all of the things you can now observe that you did not notice before.

Classroom Lighting Design

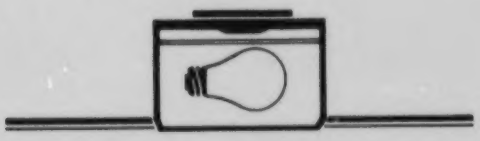
Since so much classroom activity requires adequate light, careful planning of classroom lighting is extremely important.

The first thing to be considered is the light source. The main light sources are likely to be sunlight, tungsten filament, and fluorescent light. Because sunlight is very powerful, it is important to consider window design and the angle of sunlight that will fall on various parts of the room. Where direct sunlight falls, students are likely to suffer from glare, which impairs the ability to see detail. Sunlight glare can be controlled by glazed windows or by shades.

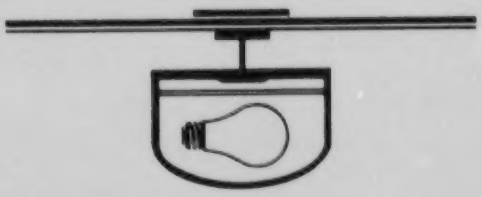
With any kind of light, diffusing and reflecting surfaces must be considered. The following diagrams show some of the alternatives in lighting design.

Semi-recessed

Ceiling or surface



Recessed or flush



Pendant

ON YOUR OWN

1. Make a list of all the things you now notice about lights in the room that you did not see before.

2. Although all human beings possess the same basic senses, your mind will focus your senses in highly individual ways, depending on your point of view. Imagine that you are a professional in one of the following careers. Looking at the room, jot down the new and different features you can observe: fire safety inspector, security agent preparing for a visit from the president, photographer, antique collector, artist specializing in still life, hostile newspaper reporter, parent checking the room for anything that might be dangerous to a small child.

WITH A PARTNER

Choose a partner who observed the room from the point of view of a different career. Compare the features you noticed. Compare the words you used in your descriptions.

Language and Perception

Language is one of the most powerful ways your mind shapes your perceptions. Naming things helps you focus on specific aspects of your environment. If you look at a group of people or at a complex machine, you are likely to see simply a crowd or a jumble of parts. However, if you know the names of the people in the crowd, you see them more as individuals, and if you know the names and functions of the parts, the machine is more likely to make sense. In the following exercise you will discover how naming objects influences your perception.

ACTIVITY:

Naming Your World

ON YOUR OWN

1. The picture on the next page may be completely unfamiliar to you at first. It is a Mayan inscription that has something to do with recording history. Take five minutes to write as thorough a description as you can.

2. Now look at the picture again. Remember that the Mayan inscription is a kind of early writing. Go through and give a name to everything you see that you think might have significance. Your name can suggest a meaning, like "monkey's head" or can simply describe the shape, like "ball with wavy lines." Notice which pictures or symbols are repeated.

IN A GROUP

In groups of four or five students, compare your labels by discussing the following questions: Did you all see the same objects? Did you give them the same names? Did the kind of names you were using influence what you saw? For example, did people who used animal names see different things than did people who used shape names?

Photograph by Dr. Rosemary A. Joyce

Reflection: Compare the paragraph you wrote describing the Mayan inscription in part 1 of the last activity with the list of labels you wrote for part 2. Were your perceptions different when you did the two assignments? How much could you add now to your first description? Was there anything in your first description that was not included in your list of labels?

Think back over what you have learned about the way your mind guides your perceptions and write in your reflection journal three or four suggestions of ways to observe carefully, thoroughly, and accurately.

Going Beyond

- Think of one of the other courses you are taking. Look back at the vocabulary you learned at the beginning of that course. Are there any things you can now see in the subject that you would not have noticed if you had not learned the vocabulary? Has learning the vocabulary for that course in any way limited your perceptions? For example, while learning the names of the parts of a leaf in biology, do you overlook any aspects of a tree that you might have noticed previously?
- Advertisers sometimes try to create a need for their products by giving names to problems that people might not have been aware of before. For example, advertisers of Listerine began using the medical term "halitosis" for bad breath, thus making people more conscious of breath odor. "Ring around the collar" is another label that makes a problem more visible, and therefore makes the need for laundry detergent seem more compelling. Observe TV commercials to see if you can find other examples of ads which create a need for a product by inventing vocabulary to draw people's attention to new concerns. In your reflection journal under the heading "Created Needs," list the three best examples and describe the problems they call attention to.
- The media, such as television and movies, serve as extenders of our senses, but media have a built-in focus or filter because they can only pick up or transmit a very small portion of the total environment. A television news program, for example, is very selective in what it "sees." In your reflection journal under the heading "Media Vision," make a list of the kinds of people and events that the television camera of your local or state news team is likely to "see." Make a list of the people and events that the television news program usually tunes out and ignores. Are the kinds of people and events the television camera notices more important than the things it ignores?

Reflection: The following are some specialized vocabularies that are useful in perceiving certain aspects of the environment. Make a list with three columns. In column 1 list the vocabularies you already know pretty well. In column 2 list those you think it might be useful to learn. In column 3 put those you think would be of no use to you.

- computer terms
- medical terms for parts of the body
- football vocabulary
- parts of a horse
- parts of a car engine
- kinds of flowers
- words describing layout of a newspaper
- names of woodworking tools
- cooking tools and techniques
- parts of the atom
- childhood diseases
- banking terms

Write in your reflection journal a paragraph describing the ways in which you expect your vocabulary to grow and influence your perceptions in the next five years. Make up a title for this paragraph.

LESSON 2: Images and Reality

The way you perceive the world is based to a great extent on what your mind thinks the world is like. All of us have images or pictures in our minds of what the world is like, and those images guide our perceptions. The following activities will help you see more clearly the image of reality in your own mind.

ACTIVITY:

Images in Your Mind

ON YOUR OWN

Look at the following puzzle. In two minutes, list all of the things in the picture that don't fit with the reality you know. (Hint: A typical seven-year-old found thirteen of them.)

AS A CLASS

Do something a seven-year-old doesn't usually do and reflect on your thinking processes by discussing the following questions:

1. How did your mind decide what was wrong in the picture? Which of the things in the picture did your mind reject simply because they were unexpected (like a flower on a rug being watered), and which did your mind reject as impossible or contrary to reality (like a string on the moon)? Are there any things whose reality you would hesitate to believe even if you saw them?
2. Look at several of the images that are contrary to reality. Does your mind reject the fish, apple, and stars in the bottom left corner? If so, why? What does your mind tell you should be under the floor?
3. Did you list as impossible the whole image of mice living in a human-style house? If not, why not? Why would your mind be less likely to reject mice living in a human house than a television in a stove or a foxtail on a mouse?

Inadequate Images

Our first tendency when we see something that contradicts our image of reality is to question the new information. You probably assumed right away that the picture you just looked at was not a picture of the real world. But what happens when you find out that the new information is accurate? Suppose you really did find a house with mice dressed in clothes watching television! Then you would have to change your image of the way the world works.

As you have grown up, you have constantly, without thinking about it, been revising your image of reality. As your mind receives new information, you are constantly developing a more thorough and mature image of reality. Often you develop mistaken images of reality from misinformation or incomplete information. Sometimes, for example, you may have confused fantasy and reality. As a child, you may have thought that television heroes existed in real life or that Superman and Santa Claus could really fly. You may have developed stereotypes when you learned a little bit of information about another group of people and assumed that everyone in that group had those characteristics. In the following activity you will review some of the times that you have changed your image of reality.

ACTIVITY:

Outgrowing Inadequate Images

ON YOUR OWN

Think of a time when you recognized that your image of reality was inadequate. The following is a list of common situations when people discover the inadequacy of their images. Look through the list and try to think whether you have been in any of these situations or whether you can remember other situations in which you realized your image was inadequate.

1. Recognizing that childhood beliefs in the existence of Santa Claus, the tooth fairy, or ghosts were fantasies
2. Finding out that your first impressions of another person or group of people were wrong or too simple
3. Finding out that science disagreed with your perceptions, for example, in asserting that the earth is round and goes around the sun and that the sun is bigger than the earth
4. Finding out that your parents or teachers were not perfect
5. Finding out that something was not nearly as simple to do as you had thought it was, for example, babysitting or saving money for a special purpose

Write a paragraph describing your old belief, the incidents or situations that made you question your old image, your feelings about questioning the image, and the way you developed a new image.

AS A CLASS

Discuss the following:

1. Briefly discuss with your classmates your example of how you changed images.
2. How did you react to discovering that your image was inadequate? Did you have an emotional reaction when you recognized contradictions? What were some of the emotions you felt? Did you immediately interpret these emotions as signs that your image of reality needed to be changed, or did you at first react in anger to someone else, or in frustration at your own limitations? What ideas do you now have for recognizing more quickly that your images need changing?
3. Could you describe the process of image-changing, or did it seem to happen automatically once the contradiction was recognized? Did you ever make a mistake and change your image of reality too soon or change to a worse image? How could you avoid making such a mistake in the future?

Stereotypes

Often we form mistaken images and concepts in our minds because we have formed our images from too few examples. A mental image formed from too few examples is called a stereotype. For example, if you read one story or see one television show about another country, you are likely to assume that everyone in that country is like the people you have seen, or if you know only one person from a particular ethnic group or profession, you may assume that everyone in that group is like that person.

ACTIVITY:

Outgrowing Stereotypes

WITH A PARTNER

Discuss the following questions:

1. Imagine that in another country, the television program "Dallas" was the only example most people saw of America. (If not everyone in your class is familiar with "Dallas," choose another adult show with a supposedly realistic setting.) What stereotypes do you think they would have of Americans? Make a list of the new information you would want to give them to help them develop a more accurate image of Americans.

2. For each of the following countries, describe the image that comes first into your mind. Is your image similar to that of your partner? Where did that image come from? Do you think it is an accurate image or a stereotype? What other kinds of information do you need to develop a more accurate picture of that country? You may not have any image for some of the countries.

Guatemala
Russia
Japan
Nigeria
Switzerland
France
Palestine
Scotland
Argentina
Vietnam
Germany

Going Beyond

1. Changing images can be such an emotional experience that people often write about the experience. In fact, such a change is often the stuff of literature, including biography. Think about the literature you have discussed in class this year. In what stories, or plays, or novels has a main character changed the image of his or her world? How did the image change?

2. Choose one of the following short stories or another recommended by your teacher and notice how the main character's image of the world, or of an important person or aspect of his or her world, has changed.

Robert Cormier, "Guess What? I Almost Kissed My Father Goodnight"
Katherine Mansfield, "The Garden Party"
Ray Bradbury, "Dark They Were and Golden-Eyed"
Abioseh Nicol, "Life Is Sweet at Kumansenu"
Toni Cade Bambara, "Raymond's Run"
Luigi Pirandello, "War"
James Thurber, "The Catbird Seat"
Ursula Le Guin, "The Ones Who Walk Away from Omelas"
Arthur Conan Doyle, any Sherlock Holmes story

Answer the following questions: (a) What image changed during the story? (b) Was it an image of the way the world works as a whole or was it an image of a specific person or society? (c) What was the character's image of the world at the beginning of the story? How was it different at the end? (d) What kind of experience caused the image to change? (e) How did the change affect the person(s) emotionally?

3. A person's experiences shape his or her image of reality. Interview older people, maybe your parents, who lived through the following experiences and ask them to describe how their images of reality changed as a result of the experience.

Sputnik or the first man on the moon
World War II
The Holocaust
The Great Depression
The Vietnam War
The assassinations of President Kennedy and Dr. Martin Luther King, Jr.
A natural disaster such as a flood or tornado
The birth of a couple's first child
The death of a parent
The invention of TV or computers

Sometimes a terrible personal experience can create such a powerful image of reality that a person is unable to change that image as reality changes. Did you feel that this had happened to any of the people you interviewed? Can you think of anyone who has had personal experiences that have created such a strong image of one reality that he or she is unable to see different conditions?

4. Write an autobiographical anecdote of two or three pages, describing a historical event or personal experience that influenced your own image of reality.

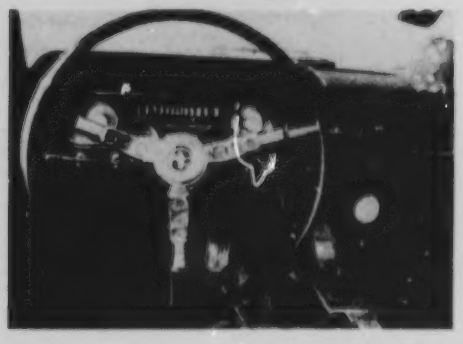
LESSON 3: Point of View

As we have seen, our perceptions of the world around us are always limited reality. What our senses take in is only a small part of what is there, and our minds actually use only a small part of what our senses perceive. As a result, when two people look at the same thing, the information that ends up in their minds is often quite different. We say that each person has a different point of view.

The fact that different people have different points of view can create problems, or it can turn out to be an advantage. If people communicate their points of view well, then everyone can see more. But if people fail to recognize that other people see things differently, they can end up fighting. The following activities give you a chance to explore the way different points of view can be used effectively.

ACTIVITY:

Noticing Different Points of View



ON YOUR OWN

1. Imagine that you are interested in buying a used car. Look at these pictures of a used car from different points of view. Make a list of the things that you can see about the car from each different point of view. If you could see the car from only one point of view, which would be the most important to you as possible buyer?

2. Other people can look at the same car and see something different because of their experience and training. We also call the different perspectives of different people "points of view," even though the differences they see result from different experiences instead of different physical positions.

Suppose that you could bring each of the following people to look at the used car you wanted to buy. Write a sentence telling what each person might be able to see because of his or her experience that others might miss. Which would you choose to bring?

a. a mechanic
b. a car salesman
c. your mother
d. your friends

IN A GROUP

Compare your answers with those of two classmates. Which answers do you disagree on? Why are your points of view different? What things have influenced your point of view about an automobile?

ACTIVITY:

Using Different Points of View

Since everyone sees a problem or situation from a different point of view, it is often possible to come up with better ideas by hearing many different points of view.

ON YOUR OWN

Write a paragraph describing the recreational/sports opportunities in your school or community and what else is needed from your point of view. Simply tell what you enjoy doing in your leisure time and what facilities you would like to have around. Do not consider whether other people enjoy the same things you do.

IN A GROUP

Compare your papers in a small group. Make a chart showing the things everyone agreed on and the things seen by only one or two people. Discuss what affects people's different perceptions. Does living in a different part of town affect their perceptions? Does having a car or living on a busline affect perceptions? Do interests affect perceptions? What other things affect perceptions? What mistakes would one make by looking from only one point of view? If you were going to plan new recreational facilities for the community, how could you find out other people's points of view?

Reflection: Write a paragraph in your reflection journal comparing your first ideas about needed recreational opportunities with your ideas after discussion with the group. How much did your ideas change after hearing other points of view?

ACTIVITY:

Point of View and Conflict

The mother and the son in this cartoon are physically in slightly different places in the boy's room. However, the physical point of view alone is not enough to explain their differences in perception.

ON YOUR OWN

Write a paragraph describing the room as you think the mother might describe it to her friend. Then, in a second paragraph, describe the room as the son would describe it to his friend.

IN A GROUP

Discuss the following questions:

1. How do you account for the difference in point of view between the mother and the son? Are their different points of view the result of different images in their minds? Are they the result of something else? Would you expect there to be a conflict between the mother and the son? Why?

2. Dramatic situations often grow out of conflicts resulting from different points of view. Select two members from your group to improvise a skit showing the conversation between the mother and son as they discuss the room.

AS A CLASS

Present your group's skit to the class and observe the other groups' skits. After each skit, discuss whether the skit showed the mother and son understanding each other's point of view or not. List on the board all of the things the characters did that hindered understanding of the other person's point of view. Then list all of the things they did that helped each understand the other person's point of view. After all of the skits have been presented, summarize the most important things one can do or avoid doing in a conflict to help understand the other person's point of view.

Reflection: In the last three activities you observed or participated in discussions about differences in point of view. In looking at the car and in discussing recreational/sports needs in the school or community, you probably found that you had a different point of view from at least some members of the class.

In your reflection journal, write a paragraph describing how you honestly felt when you discovered that your point of view was different from others'. Tell how you communicated your disagreement to another person and how he or she reacted. How did you find out about the disagreement? Do you feel that you learned much from each other, or could you have changed the discussion in order to learn more?

LESSON 4: Emotions, Perceptions, and Manipulation

Our perceptions are influenced not only by our mental images, but also by our environment. The weather, the physical setting, and the people around us affect both what we perceive and how we interpret our perceptions. Our perceptions can also be manipulated by others who know how to use the effects of our environment. The following exercises will help you explore some of the ways the environment influences your perceptions and some ways you can resist manipulation.

ACTIVITY:

Perception and Environment

ON YOUR OWN

Write your answers to the following questions.

1. In which of the following situations are you most likely to perceive a book as especially hard to read?

a. In the cafeteria with students around
b. At home alone in your room
c. At home watching television
d. In class if you are asked to read out loud

2. You have been given a very difficult math problem for homework. In which situations are you most likely to perceive it as impossible and in which are you most likely to perceive it as solvable?

a. You have been asked to solve it on the chalkboard in front of the class.
b. Your parents have just yelled at you for making bad grades and have sent you to your room.
c. You have just fallen in love, and the person you are in love with is helping you do your homework.
d. You have just gotten the results of a test, showing that you have very high math aptitude.

3. In which situations are you most likely to feel a romantic attraction to someone you have just met?

a. There has just been a tornado which damaged your house. You are waiting for the ambulance to come for your injured mother.
b. It is one of those days when everything has gone wrong. You are standing out in front of the school in the rain waiting for the bus.
c. You are at a school dance, and your date has just gone off with someone else.
d. It is the night before your term paper is due in social studies and you are only half through. You are likely to fail the course if you do not have the paper ready on time. You are at the library doing last-minute research.

4. You see a shabbily dressed man coming toward you. Under what conditions are you likely to perceive him as dangerous and under what conditions are you likely to perceive him as friendly?

a. He follows you at a shopping mall.
b. You are working at a fast-food restaurant, and he is coming up to the counter.
c. You are standing with friends in front of the school in the middle of the afternoon.
d. You are with your boyfriend or girlfriend and your car is stalled in a deserted area.

AS A CLASS

Share your answers with your classmates by raising your hand as your teacher reads off the possible answers. Then discuss the following questions:

Did most people in your class agree, or did the environment seem to affect people differently? Which question did you find easiest to answer? Most difficult? In which question did the environment seem to affect your perceptions most?

ACTIVITY:

Manipulation of Perceptions

ON YOUR OWN

Imagine that you are a movie producer. Choose which one of the following movies you would like to produce:

1. A horror movie about a psychopathic killer
2. A romantic comedy about a woman and a not-very-successful rock star

3. A bittersweet story of the last love of a young athlete dying of leukemia

4. An exciting adventure about a mysterious person involved in a dangerous profession and someone whose life is endangered

The following characters and dialogue could serve as the opening for any of these movies, but the director would manipulate the audience's emotions to create the right mood for the movie by using music, weather, camera angle, and lighting. Write a paragraph describing the weather, the music, the lighting, the camera angle, and the special effects you would use for the opening scene below.

Scene I: A busy city street. A young woman carrying several packages is crossing the street. A car speeds around the corner, brushing against her. She falls to the curb and her packages fall to the sidewalk.

Young woman: Stop! Help!
Young man: Are you all right? [He helps her to her feet.]
Young woman: I think so. That idiot tried to run me down!
Young man: I saw it. I'm just sorry I couldn't get the license number. Let me help you pick up your packages. Can I help?

WITH A PARTNER

Tell what mood and feelings you were trying to create through your choice of music, lighting, and other aspects of the setting. Compare your approach with your partner's and exchange ideas about making your paragraphs more effective. For example, were either of your approaches based on stereotypes? Would the details of setting be more interesting, for instance, if you originally depicted the rock star as a man, but decided to make the woman the rock star instead?

Reflection: Look back over your reflection journal entries from this unit. Think about what you have learned about the way your mind perceives the world. Make a list of suggestions for yourself to use in times when accurate perception is crucial.

Relationships and Connections

AS you discovered in Unit 1, our minds are constantly taking in information from the world around us, but even as we perceive the world our minds are sorting the information and relating it to what we already know. Our minds see the connections between one part of the world and another, but our minds do more than that. Our minds create new connections and change the world around us. We see the possibility of new connections, so we go ahead and create them.

In this unit you will be exploring three different kinds of connections. You will first explore the way your mind makes *comparisons* and some uses you can make of that skill. You will next explore the ways your mind perceives *relationships* between wholes and parts and will perhaps develop more sophisticated ways of thinking about these connections. You will finally explore the ways your mind perceives the possibilities for creating *new connections*.

LESSON 1: **Comparisons**

The following story illustrates several ways in which our minds make connections.

The Blind Men and the Elephant

It was six men of Indostan
To learning much inclined,
Who went to see the Elephant
(Though all of them were blind),
That each by observation
Might satisfy his mind.

The *First* approached the Elephant,
And happening to fall,
Against his broad and sturdy side,
At once began to bawl:
"God bless me! but the Elephant
Is very like a wall!"

The *Second*, feeling of the tusk,
Cried, "Ho! what have we here
So very round and smooth and sharp?
To me 'tis mighty clear
This wonder of an Elephant
Is very like a spear!"

The *Third* approached the animal,
And happening to take
The squirming trunk within his hands,
Thus boldly up and spake:
"I see," quoth he, "the Elephant
Is very like a snake!"

The *Fourth* reached out an eager hand,
And felt about the knee.
"What most this wondrous beast is like
Is mighty plain," quoth he;
" 'Tis clear enough the Elephant
Is very like a tree!"

The *Fifth,* who chanced to touch the ear,
Said: "E'en the blindest man
Can tell what this resembles most;
Deny the fact who can,
This marvel of an Elephant
Is very like a fan!"

The *Sixth* no sooner had begun
About the beast to grope,
Than, seizing on the swinging tail
That fell within his scope,
"I see," quoth he, "the Elephant
Is very like a rope!"

And so these men of Indostan
Disputed loud and long,
Each in his own opinion
Exceeding stiff and strong,
Though each was partly in the right,
And all were in the wrong!

John Godfrey Saxe

ACTIVITY:

Seeing Connections

ON YOUR OWN

The blind men tried to understand something unfamiliar by comparing it to things they already knew. Make a chart like the one below. List the part of the elephant each blind man perceived and describe what he compared it to. Then list all the similarities between the part of the elephant and what it was compared to:

Part of the Elephant	Compared to	Similarities

AS A CLASS

After you have completed your chart, discuss with your classmates the following questions about the thinking strategy used by the blind men.

1. The blind men tried to understand something new by comparing it to something familiar. What are the advantages of this strategy? How else could they have described the elephant to someone who had never seen one?

2. What problems did the blind men have in thinking about the elephant? How could they have avoided these problems?

Reflection: Recall a time when you tried to understand something new by comparing it to something familiar. For example, you may have tried to compare a new game, a new house, a new school, or a new car to one you already know about. Write a paragraph in your reflection journal telling how useful this strategy was. Did you make any mistakes from expecting too many similarities, or did the comparison help?

Making the Strange Familiar

The kind of comparison the blind men used is called a *metaphor.* A metaphor is a comparison between two unlike things, things that do not normally belong to the same category. For example, the blind men compared the elephant's ear to a fan—and we do not usually think of ear and fan being similar. If they had compared the elephant's ear to a dog's ear or a cow's ear, it would have been a simple comparison, not a metaphor.

Creating metaphors by seeing relationships between unlike or unrelated things is a basic creative thinking skill. Metaphor, as you probably already know, is frequently used in poetry and creative writing, but it is also basic to all of our thinking processes. The process the blind men used to make something strange seem familiar is a process that underlies our language.

ACTIVITY:

Words from Metaphor

The words listed below are relatively recent additions to our language. All of them are metaphors, identifying a new invention with something old and familiar.

IN A GROUP

Working with a small group of your classmates, describe for each of these terms the familiar object that the new object is being compared to and tell how they are alike.

- space colony
- cloverleaf (highway interchange)
- island (in the middle of a highway)
- snake (plumber's tool)
- hood (of a car)
- spaceship
- laser gun
- queen bee

List any other new words you can think of which were created by metaphor.

Metaphor and Poetry

Metaphorical thinking is a central process in poetry—so central, in fact, that in poetry, metaphorical comparisons are broken down into smaller categories. In poetry, a comparison between two unlike things using "like" or "as" to connect them is called a "simile," as in "She

was quick as a gazelle on the tennis court." And writing about an inanimate object as if it were a human being is called "personification." "Metaphor" is usually reserved for direct comparisons, as in "She was a gazelle on the tennis court," though "metaphor" is often used as a general term to include many figures of speech—similes, metaphors, personification, metonymies, and others.

The use of metaphorical language gives poetry power. In poetry, metaphor is often used to make an abstract idea more concrete by comparing an idea or an emotion with a physical object.

ACTIVITY:

Metaphorical Effects in Poetry

ON YOUR OWN

Rewrite each of the following poems, putting the ideas expressed in metaphor (in the general sense) into ordinary language. For example, you might begin by rewriting the first three lines of "Harlem" as "What happens to a dream that doesn't come true? Does it lose its power?"

Harlem

What happens to a dream deferred?

Does it dry up
like a raisin in the sun?
Or fester like a sore—
And then run?
Does it stink like rotten meat?
Or crust and sugar over—
like a syrupy sweet?

Maybe it just sags
like a heavy load.

Or does it explode?

Langston Hughes

Sonnet 130

My mistress' eyes are nothing like the sun;
Coral is far more red than her lips' red;
If snow be white, why then her breasts are dun;
If hairs be wires, black wires grow on her head.
I have seen roses damask'd, red and white,
But no such roses see I in her cheeks,
And in some perfumes is there more delight
Than in the breath that from my mistress reeks.
I love to hear her speak, yet well I know
That music hath a far more pleasing sound;
I grant I never saw a goddess go,
My mistress when she walks treads on the ground.
And yet, by heaven, I think my love as rare
As any she belied with false compare.

William Shakespeare

AS A CLASS

Read several of the rewritten poems and discuss with your classmates the following questions: Are the meanings of the original and rewritten poems the same? Do metaphors convey something that cannot be adequately expressed in any other way? If so, why is that?

Reflection: In your reflection journal, write a short poem using metaphors to express how your mind works. If you do not have any other ideas, you can simply fill in the blanks in the following form. Your poem does not have to rhyme, and you do not have to use the word "like."

- My mind is like a _____.
- Or sometimes it is like a _____.
- When it is tired it is like a _____.
- But on good days it is [illegible] a _____.

LESSON 2: Understanding Analogies

The ability to see similarities and relationships is important to good thinking. In fact, questions requiring a person to perceive relationships are often used as a basic test of reasoning ability. The most common relationship problems are *analogy* problems. An analogy is a comparison between two dissimilar things that notes their similarities. An analogy might be described as an extended metaphor. The meanings of the two terms overlap somewhat, but usually an analogy implies some specific points of comparison, whereas a metaphor usually suggests only the overall similarity but does not explain similarities point by point.

Analogy Questions

Analogy questions test your ability to see relationships between objects or ideas. In its simplest form, an analogy is expressed as a ratio: "Puppy *is to* dog as kitten *is to* cat." Sometimes the analogy is written with symbols replacing the underlined words: "Puppy : dog : : kitten : cat."

When confronted by an analogy question, begin by asking yourself, "What is the relationship between the first two words?" For example, in the analogy question, "Puppy is to dog as kitten is to _____," begin by asking what the relationship is between puppy and dog (the first is a young offspring of the type of animal labeled by the second term). Then choose (or think of) a word that has the same relationship to the third term. For example, cat has the same relationship to kitten as dog has to puppy.

ACTIVITY:

Solving Analogy Problems

ON YOUR OWN

On the left-hand page of your notebook, number from one to ten and complete the following analogies.

1. author : book : : composer : _____ .
   a. mother
   b. grandparent
   c. typewriter
   d. symphony
2. hay : horse : : seed : _____ .
   a. parakeet
   b. plant
   c. flower
   d. cow
3. green : grass : : red : _____ .
   a. football
   b. strawberry
   c. book
   d. orange
4. train : rails : : automobile : _____ .
   a. tires
   b. gasoline
   c. highway
   d. pistons
5. sap : tree : : blood : _____ .
   a. automobile
   b. jungle
   c. turnip
   d. donkey
6. ink : pen : : lead : _____ .
   a. heavy
   b. pencil
   c. direct
   d. paper
7. power : dominance : : weakness : _____ .
   a. poverty
   b. sickness
   c. submission
   d. leadership

8. king : subjects : : coach : _____ .
   a. team
   b. football
   c. strategy
   d. first-class
9. germ : disease : : disease : _____ .
   a. health
   b. virus
   c. finger
   d. death
10. thunderstorm : weather : : station wagon : _____ .
   a. family
   b. automobile
   c. gas mileage
   d. ambition

Making the Familiar Strange

Creative thinking often involves using an analogy to see something familiar in a new way by comparing it to something strange. In the following passage, Desmond Morris helps us see new aspects of human leadership by comparing it to baboon leadership.

Leadership

If you are to rule your group and to be successful in holding your position of power, there are ten golden rules you must obey. They apply to all leaders, from baboons to modern presidents and prime ministers. . . .

You must clearly display the trappings, postures, and gestures of dominance. For the baboon this means a sleek, beautifully groomed, luxuriant coat of hair; a calm, relaxed posture when not engaged in disputes; a deliberate and purposeful gait when active. There must be no outward signs of anxiety, indecision, or hesitancy.

With a few superficial modifications, the same holds true for the human leader. The luxuriant coat of fur becomes the rich and elaborate costume of the ruler, dramatically excelling those of his subordinates. He assumes postures unique to his dominant role. When he is relaxing, he may recline or sit, while others must stand until given permission to follow suit. This is also typical of the dominant baboon, who may sprawl out lazily while his anxious subordinates hold themselves in more alert positions nearby. The situation changes once the leader stirs

into aggressive action and begins to assert himself. Then, be he baboon or prince, he must rise into a more impressive position than that of his followers. He must literally rise above them, matching his psychological status with his physical posture. For the baboon boss this is easy: a dominant monkey is nearly always much larger than his underlings. . . . For the human leader, artificial aids may be necessary. He can magnify his size by wearing large cloaks or tall headgear. His height can be increased by mounting a throne, a platform, an animal, or a vehicle of some kind, or by being carried aloft by his followers.

(From Desmond Morris, *The Human Zoo* [New York: Dell, 1969], p. 39)

ACTIVITY:

Analyzing an Analogy

AS A CLASS

Discuss the following questions with your classmates.

1. Skim back over the paragraph and note all ideas about human leadership that you had not thought of before reading this paragraph. Is it easier to see the characteristics of dominance in a baboon society than in a human society? Why?
2. Now make a list of all the ways you can find in which this comparison between people and baboons could mislead a reader. Note all of the ways in which human societies are different from baboon societies that are ignored in the paragraphs.

ACTIVITY:

Writing with Analogy

AS A CLASS

Look at the following two columns of words. As a class, go through each item in the left-hand column. Then brainstorm ways items on the right-hand side could be similar.

friendship	an English class
a rock concert	school politics
an athletic team	a school dance
romance	a spider web
war	a clock
a zoo	a jungle
an anthill	a storm

ON YOUR OWN

Choose one of the metaphors suggested in your class brainstorming session that you think provides the most interesting new way of looking at the thing in the column on the left. Write a paragraph or a short essay showing the new insights one can get about the item in the left column by comparing it with the item in the right column. You might use Desmond Morris's paragraph as a model, or you might simply begin with a topic sentence such as one of the following:

"Watching a school election approaching is like watching a storm coming."

"To catch a new friend, a person has to be as clever and patient as a spider."

Problems with Analogies

Analogies are very useful in explaining ideas, but as you discovered in reading the Desmond Morris piece analogies can also be misleading. Often writers will make the mistake of using an analogy to make a point clearer, but will then forget that it is simply an analogy and will argue that because something is true in one case it must be true in the other. This is called "argument from analogy." Without the support of other kinds of argumentation, it is not a valid way of reasoning.

Going Beyond

Look through the editorials and letters to the editor in your local newspaper for examples of analogy. For each analogy you find, explain whether the author uses the analogy correctly, as one approach to making a point, or whether he or she depends too strongly on the analogy to persuade the reader.

LESSON 3: Relationships between Wholes and Parts

In the last two lessons, you have learned to make connections with various kinds of comparisons. In the next two lessons you will explore ways of thinking about relationships between wholes and parts.

Analysis

Analysis is one of our most common thinking processes. In analysis, a thinker tries to understand something complex by breaking it down into smaller, more manageable parts. A large percentage of your schoolwork involves analysis. Knowledge itself is broken down into various subjects, and in most subjects the topics are broken down into smaller pieces. English, for example, is often divided into parts such as literature, grammar, and composition. Literature is often classified as poetry, short stories, novels, drama, and the many kinds of nonfiction. Sometimes even poetry is divided into meter, figures of speech, tone, and other elements.

ACTIVITY:

Understanding Analysis

ON YOUR OWN

Read the following paragraph and observe the way it is organized.

A popular vocational guidance test classifies people and jobs into three categories. First are jobs in which one works with things. Mechanics, artists, gardeners, housekeepers, cooks, and scientists manipulate objects. The second kind of jobs includes those in which one works with people. Teachers, ministers, receptionists, politicians, and

entertainers spend most of their time working directly with people. Finally, there are people who work primarily with ideas. Writers, inventors, computer programmers, and city planners spend their time shaping ideas that other people will develop with either people or objects. Some jobs, of course, combine all three types of work. The vocational guidance test suggests that a person should look for the kind of job that fits the way he or she already spends the most time.

IN A GROUP

Discuss the following questions with three or four classmates.

1. What is the whole that is being described?
2. What are the parts that it has been divided into?
3. Can you think of any other way this topic could have been described without breaking it down into parts?
4. Are these the only ways the topic could be divided up or can you think of other ways it could be divided?
5. Has anything been left out of the analysis?

ACTIVITY:

Writing an Analysis

ON YOUR OWN

Write your own analysis paragraph. Choose one of the following topics. Break it down into three to five parts. Write a topic sentence about the overall subject and then briefly explain the parts.

- types of popular music
- kinds of friendship
- styles of clothing
- types of team sports
- types of cars

WITH A PARTNER

Exchange papers with a partner (preferably, someone who chose the same topic) and discuss how each of you chose to divide your topic into various parts. If your approaches were different—for example, "types of cars" might be approached from the standpoint of size, body style, function, or other angles—your analyses will differ more greatly than if you chose the same approach. Exchange ideas about the strengths and weaknesses of your papers.

ACTIVITY:

The Limits of Analysis

AS A CLASS

Discuss the following questions with your classmates.

1. Look back at the poem of the blind men and the elephant in Lesson 1. Suppose that the blind men had put together all of the parts they saw of the elephant. Would they have had a complete picture of an elephant? What parts were they missing? If you could collect all of the parts of an elephant, would you have an elephant? What is it about an elephant that is more than the sum of its parts?

2. Look at the following list of things. In which of them is the whole equal to the sum of its parts? In which is there something about the whole that you could not see just by putting the parts together? With which objects could you best understand all of the parts without understanding much about the whole?

a pile of bricks
a brick house
a clock
a person
a basketball team
an orchestra
a tree
a family
a nation
a planet
a solar system
a poem

3. Can you draw any conclusions about what kinds of things cannot be completely analyzed because the whole is more than the sum of its parts?

ACTIVITY:

More Limits to Analysis

ON YOUR OWN

Read the following poem, in which Walt Whitman criticizes the attempt of an astronomer to understand the stars by analysis.

When I Heard the Learn'd Astronomer

When I heard the learn'd astronomer,
When the proofs, the figures, were ranged in columns before me,
When I was shown the charts and diagrams, to add, divide, and measure them,
When I sitting heard the astronomer where he lectured with much applause in the lecture-room,
How soon unaccountable I became tired and sick,
Till rising and gliding out I wander'd off by myself,
In the mystical moist night-air, and from time to time,
Look'd up in perfect silence at the stars.

Reflection: Think about how your mind worked and how you felt when you were discussing how the parts differ from the whole in a person, a family, or a solar system. Write a paragraph or two in your reflection journal telling how your ways of thinking and feeling compare to those of Walt Whitman in the poem.

Going Beyond

Most subjects taken in school are based on analysis. The whole subject matter is taken apart into its pieces, and each part is studied independently. Much can be perceived by this method that is not apparent from looking at the parts as a whole. However, certain things are also left out by this method. Choose one of the following examples or a recent lesson in one of your classes in which you analyzed something. Write a long paragraph or short essay describing what you learned from analysis that would not have been apparent from looking at the whole, without taking it apart. Then try to describe what the whole also contains that was missing from the study of the parts.

1. What does a frog have that is missed in dissection?
2. How is a poem different from the analysis of a poem?
3. How is the U.S. government different from its three branches?
4. How is a flower different from the parts shown in a biology book?

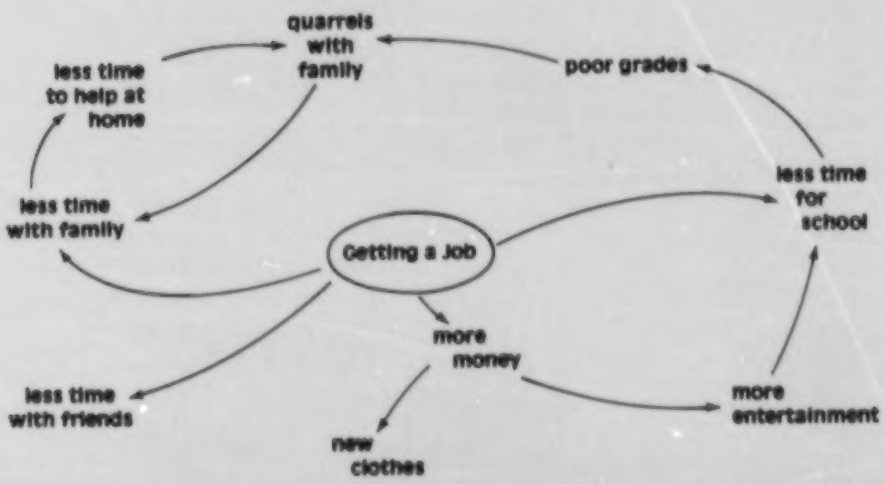
LESSON 4: Thinking about Systems

In a system (an integrated whole made up of interrelated and interacting parts), one needs to look at the way the parts are related as well as look at the parts separately.

Seeing the Web of Relationships

A web chart is one of the simplest ways of beginning to unravel the complex relationships of a whole system. To make a web chart, write the central object or event at issue in the center of a piece of paper. Then brainstorm all of the results or consequences of that event. Write them around the central event, linking them to the original event with arrows. Then brainstorm any results or consequences related to those and draw lines to show their connections.

The following web chart shows the effect that getting a job might have on a teenager's family and friends.



ACTIVITY:

Observing Relationships Within a System

ON YOUR OWN

Choose a technological invention or development that has had an impact on your life. It can be something personal, like a new hair dryer or video game, or it can be something with global implications, such as computer technology or satellites. Draw a web chart showing all of the effects that the new technology has had on you, on the way you spend your time, or on the way you interact with other people.

IN A GROUP

In groups of four or five students, discuss each other's charts. Which charts dealt with large-scale developments? Which dealt with more local or personal things? Help each other think of effects beyond those on the charts.

Unexpected Results

An existing system tries to maintain itself, to adjust itself so changes will not threaten it. Whenever an event occurs that disrupts the system, some other part of the system usually reacts to try to return the system to its original condition. For example, in society, when one group of people becomes very active in promoting a new idea, such as outlawing handguns, another group is likely to form in order to oppose the idea, thus creating a backlash. If the change is so great that the backlash is unsuccessful, there may be a revolution and the whole system will change.

Unexpected results are called *ironic*. Novelists, playwrights, and short-story writers often focus on this type of effect, so irony appears in literature as well as in reality.

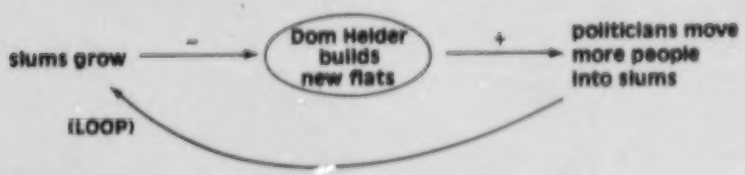
The following excerpt from a biography of Dom Helder Camara, a bishop from Brazil, illustrates how irony often results from attempts to improve social conditions.

> We decided to begin with one of the worst favelas in Rio: a slum that had sprung up like a mushroom right in the center of the city, and in fact right in the center of one of the richest and most elegant neighborhoods. We set about building new flats immediately next to the old slums. . . .
>
> The flats we built were by no means luxurious. . . . We set up a whole training program to prepare the families from the favela for living in

flats: they had lived in slums all their lives, and had never had running water or lavatories. Our plans sounded wonderful, but unfortunately they became embroiled in petty party politics. There was about to be an election. Every time we took a family out of the favela some politician would come along and put two or three or four families in its place. "Wait there and Dom Helder will build you a new flat!" It was terrible. People could see that the Saint Sebastian Crusade didn't take long to build its flats; and they were all prepared to come and wait their turn in the slums. By the time our first project was completed, we realized that instead of being wiped out, the population of the favela had doubled.

(from Dom Helder Camara, *The Conversions of a Bishop* [London: Collins, 1979])

The following diagram shows the results of Dom Helder's efforts. It is constructed much like the web chart except that arrows are used for the connections, and a plus or minus shows whether the connection increases or decreases the change. This is a very simple example of a systems diagram. One feature—the loop—shows how part of the attempts at change actually "looped" back to a previous state of affairs. Does the diagram give you any clue about what different kinds of efforts might be more successful in eliminating the favela?



ACTIVITY:

Diagramming an Ironic Situation

IN A GROUP

First read the following report on public health in Mauritius. Using a systems diagram like the one above, work with four or five classmates on a diagram of the ironic situation described.

Malaria, [a] real killer, arrived in Mauritius in 1865. . . . From the figure of 310,000 people in 1861 the growth to an estimated population of 428,000 by 1946 was very slow, about 0.5 percent. The epidemics that swept the island so frequently in the nineteenth century and well into the twentieth century appear to have been the main factor in keeping down the rate of population growth. . . .

DDT was introduced in 1948 and Mauritius became one of the showcase examples of new public health effectiveness. With typical British thoroughness the main malaria-bearing mosquitoes were practically eradicated by 1952: "The effect on population growth was dramatic. In one year the death rate fell by 32 percent. . . . Between 1948 and 1958 population increased at the rate of 3 percent per annum" [B. Benedict, "Controlling Population Growth in Mauritius," in *Technology and Social Change*, ed. H. R. Bernard and P. J. Pelto (New York: Macmillan, 1972), p. 255].

As economic conditions grew worse and worse in the 1950s, the populace had much reason to complain bitterly about lack of employment opportunities and the inadequacies of a government that could not provide for the large sector of poverty-stricken families.

(From Gretel H. Pelto and Pertti J. Pelto, *The Human Adventure* [New York: Macmillan, 1976], p. 501)

AS A CLASS

After a volunteer from each group has placed the diagram on the chalkboard, discuss similarities and differences in the diagrams. Do the diagrams include basically different elements and structures (such as loops)? No single diagram will necessarily be "right," but some might express the relationships more clearly than others.

Going Beyond

Look through a recent newspaper or newsmagazine and select a story about an individual or group trying to make some kind of change—for example, a bill prohibiting smoking in places of public assembly. Almost any proposed new law in Congress, your state legislature, or your local city council will fit this description.

First make a web chart showing all of the people that will be affected and the changes likely to be made as a result of the change proposed in the new law. Then look for possible ironic results. Will any of the changes turn into loops like the examples of the Brazilian favela or the Mauritius malaria control? If so, draw the loops. Are any of the changes likely to create a backlash?

LESSON 5: Creating Relationships

So far in this unit, we have studied several kinds of relationships. Metaphor and analogy are relationships of comparison between two objects that are not inherently related in reality. With analysis and systems thinking, we try to perceive and understand relationships already existing in reality. However, there is not always a clear difference between relationships in our minds and relationships in reality. Human beings are creators, and therefore we can change the relationships in our minds into relationships in reality.

Often our role in the creation of relationships is not obvious. Many kinds of relationships, such as friendships, change over time, and it is not always clear whether the changes are the results of our creative efforts or of other forces.

The ability to perceive patterns of change and our role in them is another important thinking skill needed today.

ACTIVITY:

Describing Relationships that Change

AS A CLASS

Discuss the changing relationships between a piece of paper and human beings from the growth of a tree until the remains of the paper turn back into carbon, oxygen, and other elements.

ACTIVITY:

Analyzing Changing Relationships

IN A GROUP

With a small group of classmates, look at the following set of pictures and answer the questions that follow. Discuss questions 1 through 4. Then write your plan for question 5. Be prepared to present it to the class.

1. Describe the relationships among all of the objects in each of the three pictures. You may want to use a web chart.
2. Which of the relationships can be changed by human decisions and which are created by nature?
3. Describe all of the differences between the relationships in pictures 2 and 3. Consider the relationships among the people as well as the relationships of the people to the land, tools, and animals.
4. Which picture do you think shows the overall best possible relationships both *among* the people, and between the people and animals and the land? If you do not particularly like either picture, draw a picture that you think shows the ideal relationships.

5. Suppose your group decides that your goal in life is to promote a change in relationships so that they resemble those in the ideal picture as closely as possible. Develop a plan of action for promoting the changes. What is most needed for the changes? Who in society can best make the changes?

ACTIVITY:

Changes in Human Relationships

ON YOUR OWN

Read the following poem, which describes the creation of relationships.

Just a Word

When dogs encounter
They hesitate,
They sense a kinship
Stop, sniff, then part.

As birds glide they tune
A mutual note,
Beak to beak greetings flare
To form the music of the air.

Even cups in a tray
Make a sound as they touch,
Leaves rustle;
Yet the human voice is hushed.

Strangers silently we passed
Only to look behind:
The other's head has also turned
As if to greet my mind.

Sheikha A. El-Miskery

AS A CLASS

Discuss the following questions with your classmates:

Describe some of the interactions among people that help get them in tune. What kinds of things do people try to "discover" at the first encounter? Describe nonverbal behaviors (such as facial expressions, gestures, choice of clothing, and the distance people choose to stand

from each other) that affect relationships. How do you nonverbally indicate an interest or lack of interest in developing a relationship?

WITH A PARTNER

Choose a partner and role-play an encounter between two strangers in which the two people either indicate an interest in forming a relationship or in avoiding it. Have your classmates guess where the encounter occurs and how the relationship will develop or end.

Going Beyond

Choose a relationship that has changed over time. Write the story of how it developed, emphasizing the conscious thought and deliberate decisions that influenced the change. You may write about a personal example, or you may prefer to research a historical example of relationships between two individuals or two groups of people.

The following are some examples of relationships you might choose, but use your own experience and imagination:

1. Changes in your relationship with a family member as you have grown up
2. Development of a friendship, either one that has continued or one that ended
3. An enemy who became a friend
4. Ups and downs in the relationships between the United States and the Soviet Union
5. How Roman Catholics and Protestants learned to live together in the United States
6. Hostility and friendship between the United States and Canada (or Japan, China, Nicaragua, or Mexico)
7. Changes in the relationship between your family and your neighborhood
8. Changes in the relationship between people and their environment in your neighborhood or your city

Reflection: In your reflection journal, draw a picture or diagram similar to those on page 45 showing your present relationship to the world and people around you. Then write a short essay describing your present thoughts about those relationships and ways you might want to change them.

Problem Solving

SOLVING problems means changing things from the way they are to the way we would like them to be. We use our minds to overcome obstacles in the way of our happiness or our survival. Problem solving is not easy. Often a simple problem disguises a much more complex one, or solving one problem creates a new one.

LESSON 1: Identifying Problems

Before you can solve a problem, you have to recognize it. Some problems, of course, are so obvious that you cannot miss them, but others may be disguised by emotional reactions. The following activities will help you identify problems you need to solve.

ACTIVITY:

Recognizing Problems

ON YOUR OWN

Take about three minutes to make a list of all the problems you can think of that you have faced in the past week. Include school problems; problems with assignments; problems with other people; problems with time, transportation, space, money, or clothes; and problems with yourself. You will not need to show this list to anyone.

Now, in about three minutes, list four problems you can think of that human beings will need to solve during your lifetime to have a desirable life or even to survive.

Go back over both lists. In the first list, put an "X" by all of the problems that you feel you solved well. In the second list, put an "X" by all of the problems you feel you know how we can solve.

Write two or three paragraphs describing the present level of your problem-solving skills. Note the kinds of problems you are able to solve well and describe the techniques you have used effectively. Describe the kinds of problems you do not know how to solve and list any skills you feel you need to develop.

ACTIVITY:

Distinguishing among Different Kinds of Problems

In William Carlos Williams's story "The Use of Force," printed below, a doctor has a problem to solve, and a child's life may depend on his success in solving it. As he tries to solve the medical problem, he is faced with several other problems.

ON YOUR OWN

Read the story through once simply to enjoy it, and then go back and reread the parts you need to in order to consider the questions.

The Use of Force

They were new patients to me, all I had was the name, Olson. Please come down as soon as you can, my daughter is very sick.

When I arrived I was met by the mother, a big startled looking woman, very clean and apologetic who merely said, Is this the doctor? and let me in. In the back, she added. You must excuse us, doctor, we have her in the kitchen where it is warm. It is very damp here sometimes.

The child was fully dressed and sitting on her father's lap near the kitchen table. He tried to get up, but I motioned for him not to bother, took off my overcoat and started to look things over. I could see that they were all very nervous, eyeing me up and down distrustfully. As often, in such cases, they weren't telling me more than they had to, it was up to me to tell them; that's why they were spending three dollars on me.

The child was fairly eating me up with her cold, steady eyes, and no expression to her face whatever. She did not move and seemed, inwardly, quiet; an unusually attractive little thing, and as strong as a heifer in appearance. But her face was flushed, she was breathing rapidly, and I realized that she had a high fever. She had magnificent blonde hair, in profusion. One of those picture children often reproduced in advertising leaflets and the photogravure sections of the Sunday papers.

She's had a fever for three days, began the father and we don't know what it comes from. My wife has given her things, you know, like people do, but it don't do no good. And there's been a lot of sickness around. So we tho't you'd better look her over and tell us what is the matter.

As doctors often do I took a trial shot at it as a point of departure. Has she had a sore throat?

Both parents answered me together, No . . . No, she says her throat don't hurt her.

Does your throat hurt you? added the mother to the child. But the little girl's expression didn't change nor did she move her eyes from my face.

Have you looked?

I tried to, said the mother, but I couldn't see.

As it happens we had been having a number of cases of diphtheria in the school to which this child went during that month and we were all, quite apparently, thinking of that, though no one had as yet spoken of the thing.

Well, I said, suppose we take a look at the throat first. I smiled in my best professional manner and asking for the child's first name I said, come on, Mathilda, open your mouth and let's take a look at your throat.

Nothing doing.

Aw, come on, I coaxed, just open your mouth wide and let me take a look. Look, I said opening both hands wide, I haven't anything in my hands. Just open up and let me see.

Such a nice man, put in the mother. Look how kind he is to you. Come on, do what he tells you to. He won't hurt you.

At that I ground my teeth in disgust. If only they wouldn't use the word "hurt" I might be able to get somewhere. But I did not allow myself to be hurried or disturbed but speaking quietly and slowly I approached the child again.

As I moved my chair a little nearer suddenly with one catlike movement both her hands clawed instinctively for my eyes and she almost reached them too. In fact she knocked my glasses flying and they fell, though unbroken, several feet away from me on the kitchen floor.

Both the mother and father almost turned themselves inside out in embarrassment and apology. You bad girl, said the mother, taking her and shaking her by one arm. Look what you've done. The nice man. . . .

For heaven's sake, I broke in. Don't call me a nice man to her. I'm here to look at her throat on the chance that she might have diphtheria and possibly die of it. But that's nothing to her. Look here, I said to the child, we're going to look at your throat. You're old enough to understand what I'm saying. Will you open it now by yourself or shall we have to open it for you?

Not a move. Even her expression hadn't changed. Her breaths however were coming faster and faster. Then the battle began. I had to do it. I had to have a throat culture for her own protection. But first I told the parents that it was entirely up to them. I explained the danger but said that I would not insist on a throat examination so long as they would take the responsibility.

If you don't do what the doctor says you'll have to go to the hospital, the mother admonished her severely.

Oh yeah? I had to smile to myself. After all, I had already fallen in love with the savage brat, the parents were contemptible to me. In the

ensuing struggle they grew more and more abject, crushed, exhausted while she surely rose to magnificent heights of insane fury of effort bred of her terror of me.

The father tried his best, and he was a big man but the fact that she was his daughter, his shame at her behavior and his dread of hurting her made him release her just at the critical moment several times when I had almost achieved success, till I wanted to kill him. But his dread also that she might have diphtheria made him tell me to go on, go on though he himself was almost fainting, while the mother moved back and forth behind us raising and lowering her hands in an agony of apprehension.

Put her in front of you on your lap, I ordered, and hold both her wrists.

But as soon as he did the child let out a scream. Don't, you're hurting me. Let go of my hands. Let them go I tell you. Then she shrieked terrifyingly, hysterically. Stop it! Stop it! You're killing me!

Do you think she can stand it, doctor! said the mother.

You get out, said the husband to his wife. Do you want her to die of diphtheria?

Come on now, hold her, I said.

Then I grasped the child's head with my left hand and tried to get the wooden tongue depressor between her teeth. She fought, with clenched teeth, desperately! But now I also had grown furious—at a child. I tried to hold myself down but I couldn't. I know how to expose a throat for inspection. And I did my best. When finally I got the wooden spatula behind the last teeth and just the point of it into the mouth cavity, she opened up for an instant but before I could see anything she came down again and gripping the wooden blade between her molars she reduced it to splinters before I could get it out again.

Aren't you ashamed, the mother yelled at her. Aren't you ashamed to act like that in front of the doctor?

Get me a smooth handled spoon of some sort, I told the mother. We're going through with this. The child's mouth was already bleeding. Her tongue was cut and she was screaming in wild hysterical shrieks. Perhaps I should have desisted and come back in an hour or more. No doubt it would have been better. But I have seen at least two children lying dead in bed of neglect in such cases, and feeling that I must get a diagnosis now or never I went at it again. But the worst of it was that I too had got beyond reason. I could have torn the child apart in my own fury and enjoyed it. It was a pleasure to attack her. My face was burning with it.

The damned little brat must be protected against her own idiocy, one says to one's self at such times. Others must be protected against her. It is social necessity. And all these things are true. But a blind fury, a feeling of adult shame, bred of a longing for muscular release are the operatives. One goes on to the end.

In a final unreasoning assault I overpowered the child's neck and

jaws. I forced the heavy silver spoon back of her teeth and down her throat till she gagged. And there it was—both tonsils covered with membrane. She had fought valiantly to keep me from knowing her secret. She had been hiding that sore throat for three days at least and lying to her parents in order to escape just such an outcome as this.

Now truly she *was* furious. She had been on the defensive before but now she attacked. Tried to get off her father's lap and fly at me while tears of defeat blinded her eyes.

William Carlos Williams

ACTIVITY:

Distinguishing Different Types of Problems

AS A CLASS

With your classmates, discuss the following questions:

The doctor had three problems to solve. First he had to diagnose the girl's illness. Then he had to cope with her refusal to open her mouth. Finally, he had to deal with his own emotions. The first was a medical (or scientific) problem, the second was a problem in relationships between people, and the third was an inner problem—a problem in his own mind and feelings. Find all of the ways in which the three problems differ. Which problem(s) had a clear solution? Which problem(s) did the doctor find easiest to solve? Which problem was similar to problems the doctor had previously solved? Which was unique in his experience? Make a chart showing all of the differences among the three kinds of problems.

ON YOUR OWN

Look back at the list of problems you wrote for the activity on recognizing problems (page 51). Go down your list and put an "S" in front of the problems that are scientific problems, an "R" in front of the problems concerning interpersonal relationships, and an "I" in front of the inner problems. Some problems may have two or three different aspects, and thus letters.

Distinguishing Problems from Hardships

Not all problems have solutions. Not all diseases can be cured. The doctor might have discovered that the child had an incurable disease or chronic disability. In that case it would have become more

important to deal with the problems in human relationships and the inner problems such a situation would create than to deal with the scientific problem. In cases like these, instead of trying to solve the problem scientifically, a person tries to find ways to live with the problem.

Sometimes you can choose whether to deal with a problem as a scientific problem, an interpersonal problem, or an inner problem. You can decide whether it is worth the energy and expense and the risk of failure to try to solve a scientific problem, or whether it would be better to deal with the situation as an inner problem of learning to cope with something that cannot be changed.

ACTIVITY:

Analyzing Different Kinds of Problems

IN A GROUP

In a group with two or three others, imagine that you are on the newspaper editorial board for an advice column. Look at each problem below and discuss whether you should deal with the problem as a medical (or scientific) problem, an interpersonal problem, an inner problem, or all three.

Dear Advice Expert:
My father is an alcoholic. He has tried everything, including Alcoholics Anonymous. He always says he is going to quit drinking, but he always goes back to it. What should I do?

Dear Advice Expert:
I am a fifth grader, and I am very tall. I seem to tower over everyone in my class. How can I solve my problem?

Dear Advice Expert:
I worry a lot about nuclear war. I have nightmares sometimes. What can I do?

Dear Advice Expert:
I have a bad temper. I get angry over nothing. What can I do about this problem?

Reflection: Think back to the feelings about problem solving you had as you were doing the previous activity and answer the following questions in your reflection journal.

1. Which kind of problem did you most enjoy trying to solve?
2. Which kind of problem did you most dislike trying to solve? Did you feel any unpleasant sensations, such as a knot in your stomach, when you thought about any of the problems?
3. Did you feel more or less confident in problem solving than the other group members? Did that feeling change from problem to problem? Why?
4. Do you dislike any kind of problem enough to try to avoid facing it or to ignore it?

LESSON 2: Solving Scientific Problems

In the last few activities, you discovered that one main kind of problem is scientific. Finding solutions to scientific problems involves making changes in the world around you. The following lesson will help you improve your skills in solving scientific problems.

ACTIVITY:

A Strategy for Solving Scientific Problems

AS A CLASS

With your classmates, discuss the following questions:

1. Review the story "The Use of Force." List the steps the doctor went through to solve the scientific problem of diagnosing the child's illness.

2. The following is a general list of the basic steps for solving a scientific problem:

a. Recognize the problem.
b. State the problem in specific terms.
c. Form a hypothesis, a guess, about the solution.
d. Gather information to support or disprove your hypothesis.
e. Evaluate whether or not your hypothesis was correct.

How does your answer to question 1 compare with this list? Do you think the doctor's strategy was effective?

3. Think back to a time when you went to a doctor. Did you follow the problem-solving model?

a. How did you recognize that you had a problem? How did you decide that you had a problem serious enough to need a doctor?
b. How did you define the problem for the doctor?
c. Did you have a hypothesis—a guess—about what the problem was? Did the doctor state a hypothesis to you? Do you think he or she had one? How could you tell?

d. What data did the doctor gather to check out his or her hypothesis? Did you gather any data to check out your hypothesis? Was the doctor's procedure any different from yours?
e. Was your diagnosis correct? Was the doctor's?

ACTIVITY:

Solving a Scientific Problem

AS A CLASS

The following problem is a test of your class's inventiveness. In no more than fifteen minutes, figure out the best way to carry five dollars in coins with nothing but an ordinary piece of 8½" by 11" notebook paper. You may work on the problem in any way you wish, but the class must agree on a single solution.

After you complete the problem, answer the following questions with your classmates.

1. How many of you would bet ten dollars that your class reached the best solution possible, that no other class could come up with a better solution? If you do not think you would have bet ten dollars, what doubts do you have about your solution?
2. Can you recall the process you used to solve the problem? What was the first thing you tried to do? What was the second? Continue reviewing your problem-solving process until you have listed all of the things that you did.
3. Now reread the problem-solving strategy in question 2 of the activity on page 58. Compare your strategy to the one listed. Which of the differences were a result of your working as a group rather than individually? How did the type of problem you had to solve influence your strategy?

Group Problem-Solving Techniques

There is an old saying that two heads are better than one. True, there are many advantages to working with other people in solving a problem. However, solving a problem with a group of people requires some additional skills. The following suggestions lead to a problem-solving task in which your entire class acts as a group.

Organizing for Work: In performing a group task, the first step must be to organize effectively. This usually means choosing a leader. If someone in your class volunteers to be leader and everyone accepts that person, you are ready to move on. If not, the person closest to the blackboard should go to the board and ask for nominations. After three or four nominations are given, ask the nominees to put their heads down and vote by raising hands.

Defining the Problem: Once you have a basic idea of what a problem is, you need to define it precisely. The most helpful way of defining a problem is to state it in the following format: "In what ways can we . . . ?" Sometimes the definition of the problem is obvious, but sometimes there are several ways of defining it. For example, in the activity on solving a scientific problem, you could have defined the problem by asking, "In what ways can we make a purse out of paper?" However, that would have restricted the possible solutions. Formulating the problem, "In what ways can we carry coins with only a piece of paper?" would allow the possibility of other solutions.

One part of defining the problem is making sure that you understand all of its restrictions. For example, you might have asked whether the five dollars consisted of quarters or pennies, and whether there were restrictions on how the money was to be carried. Could one hold the container upright or did it have to be secure enough to be turned over without spilling its contents?

Generating Hypotheses: Once you have defined a problem carefully, it is useful to consider all of its possible solutions instead of trying to jump immediately to the single best solution. A good way to do this in a group is to *brainstorm* solutions. In brainstorming, all members of the group are responsible for suggesting every idea they think of and for not reacting to anyone else's ideas, especially not criticizing or making fun of them. Every idea is listed.

After members have generated a number of possibilities, they come to agreement on one idea that is likely to be the best. If one solution is not obviously best, the group should eliminate those that are obviously unpromising, discuss those that remain, and choose one as a trial solution.

Gathering Information to Support or Disprove a Hypothesis: For some problems, gathering information will be the major part of the problem solving. For the doctor in the story "The Use of Force," gathering information by looking at the child's throat was the key step in testing his hypothesis that she had diphtheria. In the problem about carrying coins, you needed to experiment with your proposed solution to see how well it would work. Sometimes, simply sharing information that group members already have will be sufficient.

Evaluating Whether or Not the Hypothesis Was Correct: In a scientific problem, if you gather sufficient information, it should not be too difficult to decide which possible solutions are best. It is usually easy to make a decision by voting, but remember that people who disagree with the majority decision often have an important point of view. It is useful to ask people who disagree with the majority decision to state their objections. Then the group can consider whether the objections are important and whether the decision can be revised to overcome their objections.

ACTIVITY:

Trying Out Problem-Solving Techniques

AS A CLASS

Using the techniques listed above and the ideas you have from reviewing the class's first problem-solving attempt, try to solve one of the following problems as quickly and efficiently as possible.

1. Plan a bus route that would pick up six or seven people in your class who don't live near each other. The route must use the least gas possible.
2. Figure out how much paper your class uses up in a week.
3. Respond to a rival school's newspaper's accusation that students in your school aren't learning basic skills (or don't have school spirit).

Reflection: In your reflection journal write a paragraph reflecting on your contribution to the group problem-solving task. Did you contribute as much as possible? If not, what changes do you need to make in order to contribute more to group problem solving? Or, what changes does the class need to make so that you can work together more effectively? Can you contribute anything to making those changes?

LESSON 3: Interpersonal Problems

In the last lesson, you worked on some thinking skills for solving scientific problems, the kinds of problems in which you try to change the world around you. However, if your class was typical, you may have found it harder to solve the problems of working with other members of your class than to solve the problem of creating a container from paper. It is much easier to make a piece of paper do what you want it to than it is to control other people.

Interpersonal problems, as you saw in the story of the doctor in Lesson 1, are different from scientific problems, and require some different thinking skills. In fact, the thinking skills required are so different that often people who are good at solving scientific problems are very poor at "people" problems. For example, a great inventor may not be good at solving the interpersonal problems involved in developing a company to make and sell his or her inventions. Both kinds of skills, however, are important, and you should develop both kinds of thinking as much as you can. The following activities will help you develop your skills in thinking about and solving interpersonal problems.

ACTIVITY:

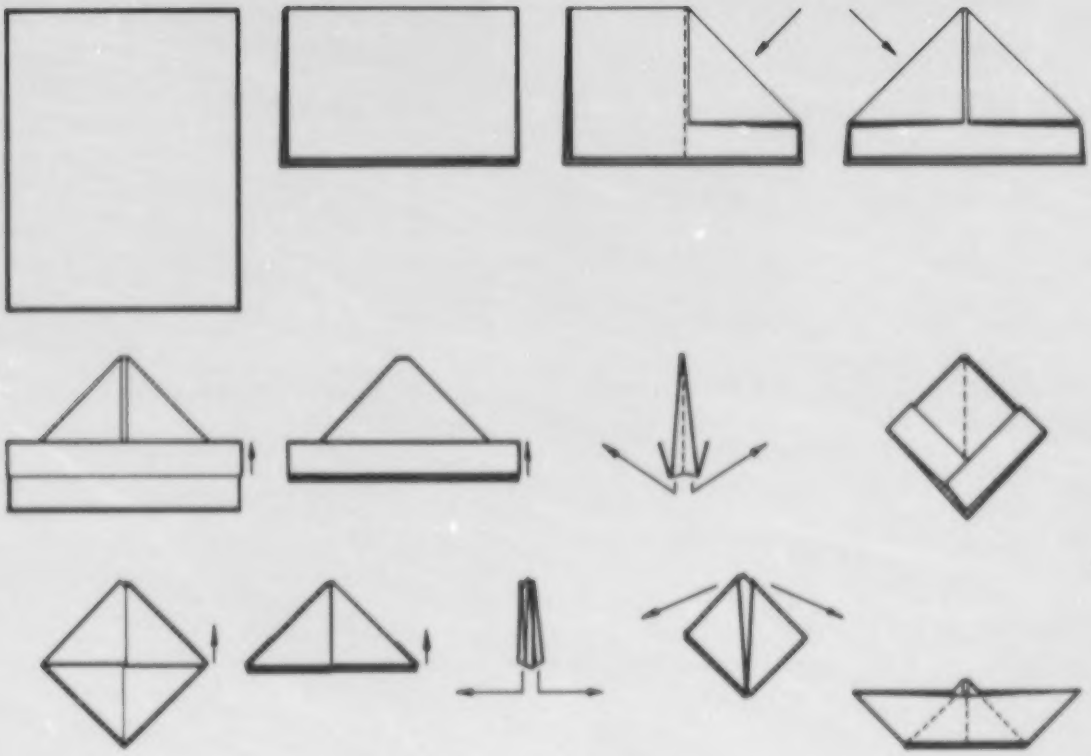
Assembly Line Game

IN A GROUP

Work in a group with two other students. Imagine that each group is an assembly line that produces paper boats. Your companies are competing, and the first company to finish ten paper boats will win the big contract. This is the way the assembly line is set up.

Person 1 will fold a piece of notebook paper in half and then fold the corners on the folded side up to meet each other.

Person 2 will fold the open edges of the paper up over each side, pull the folded edges open into a "cup," and keep pulling until the cup is flattened.



Person 3 will fold up each flap to meet the point at the top, pull the resulting "cup" open to flatten it in the opposite direction, and then pull down the "ears" pointing upward on each side to form the boat.

AS A CLASS

Discuss the following questions:

1. Which team won? Why was it most successful?
2. The assembly line was designed so that there would be several problems among the people participating. What problems did you and your group discover?
3. How did you and your group solve the problems? How did you recognize that there was a problem? Did everyone in the group recognize the problem at the same time? Did you see it as a problem in the assembly line or a problem with a person? How did you correct the problem? Did you discuss it, or did you simply shift tasks?

Solving Interpersonal Problems

Interpersonal problems are different from scientific problems in several ways, as you probably saw illustrated in the activity above. First, they often arise because people usually have to work together in situations that are unequal, or possibly even unfair. For example, some of you have to get up much earlier than others to get to school on time because of school location or transportation lines. No matter where the school is located, some will live farther from it than others. These inequalities are inevitable and simply have to be accepted. But sometimes one upset person can trouble the whole group. For example, if some students arrive late every day because of transportation problems, they and the whole class are hurt.

Two important skills in solving interpersonal problems are (1) recognizing when someone else is being hurt and (2) communicating when *you* are being hurt seriously enough that the situation needs to be corrected.

The scientific problem-solving model is often a good way to start in solving interpersonal problems. The "scientific" solution, however, usually needs to be adjusted to help those who are hurt by the solution or who do not get a fair share of its benefits.

ACTIVITY:

Solving an Interpersonal Problem

IN A GROUP

In groups of four or five students, discuss the following problem. Decide what would be the best solution to the problem for the family. Then discuss whom in the family that solution would hurt and what the other family members could do to help him or her.

The Collins family has lived in a small town near Cleveland most of their lives. They love their home. The father, Daniel, has a management position in a large company that has just decided to move to Houston. The company has offered him a large salary increase if he goes with them to Houston. If he stays, he will lose his job and is unlikely to find anything comparable in the area. The mother, Marge, teaches in a unique private school with an emphasis on the arts. The daughter, Sylvia, a high school junior, is on the basketball team, which has a very good chance to win the state championship next year. The son, Paul, a high school freshman, has a serious medical problem and is confined to a wheelchair. He could receive good medical treatment in Houston,

but is very nervous about having to leave his friends, who have accepted his handicap, and start in a new school where he would have to make new friends.

After you finish solving the problem, use the following questions to evaluate your group's problem-solving skills.

1. Did your group apply the appropriate skills from the scientific problem-solving model?

a. Did you state the problem specifically? Can you now think of a better way you could have stated it?

b. How many alternative solutions or hypotheses did you think of? Did you follow brainstorming rules?

c. How did you choose the best solution? Did you consider all of the information?

2. What things did you do in addition to the scientific problem-solving steps? Did your final solution consider the needs of every family member?

Reflection: Did you have any emotional reactions during either of the two activities in this lesson? For example, did you feel anger or resentment during the assembly-line game or during the discussions? Or did you feel sorry for any of the people in the Collins family? If so, write a sentence or two in your reflection journal describing the situations you reacted to and the emotions you felt.

LESSON 4: The Role of the Emotions in Problem Solving

In scientific problem solving, emotions usually do not come into play. In fact, people are usually discouraged from showing emotion and may even be ridiculed for becoming angry or for not behaving "reasonably."

However, the emotions play a very important role in interpersonal problems, and in identifying scientific problems that are also interpersonal problems. Environmentalists, for example, have pointed out, often quite emotionally, that most problems involving the use of the earth's resources are problems in getting groups of people to work together as well as scientific problems.

The most important role of emotions in problem solving is in identifying problems and in motivating people to solve them. In fact, perhaps the most important function of negative emotions such as anger, hostility, and depression is to signal that there is a problem that needs to be solved. Anger and depression both function much like physical pain: they draw attention to something that is wrong. The more positive emotions, such as sympathy and love, help people to recognize when others have problems and to motivate others to solve the problems.

Emotions, then, play a very important role in the thinking process. Emotions usually identify an interpersonal problem long before our rational thought processes notice it.

ACTIVITY:

Literature and Problem Solving

Rachel Carson, one of the leaders in the environmental movement, was both a scientist and a skillful writer. Her book *Silent Spring* (Boston: Houghton Mifflin, 1962), which awakened many Americans to the dangers of pesticides, was a skillful combination of poetic fiction and scientific writing.

ON YOUR OWN

Read the following two passages from *Silent Spring* and observe your reactions. Then note your reactions by answering the questions below.

A.

A Fable for Tomorrow

There was once a town in the heart of America where all life seemed to live in harmony with its surroundings. The town lay in the midst of a checkerboard of prosperous farms, with fields of grain and hillsides of orchards where, in spring, white clouds of bloom drifted above the green fields. In autumn, oak and maple and birch set up a blaze of color that flamed and flickered across a backdrop of pines. Then foxes barked in the hills and deer silently crossed the fields, half hidden in the mists of the fall mornings.

Along the roads, laurel, viburnum and alder, great ferns and wildflowers delighted the traveler's eye through much of the year. Even in winter the roadsides were places of beauty, where countless birds came to feed on the berries and on the seed heads of the dried weeds rising above the snow. The countryside was, in fact, famous for the abundance and variety of its bird life, and when the flood of migrants was pouring through in spring and fall people traveled from great distances to observe them. Others came to fish the streams, which flowed clear and cold out of the hills and contained shady pools where trout lay. So it had been from the days many years ago when the first settlers raised their houses, sank their wells, and built their barns.

Then a strange blight crept over the area and everything began to change. Some evil spell had settled on the community: mysterious maladies swept the flocks of chickens; the cattle and sheep sickened and died. Everywhere was a shadow of death. The farmers spoke of much illness among their families. In the town the doctors had become more and more puzzled by new kinds of sickness appearing among their patients. There had been several sudden and unexplained deaths, not only among adults but even among children, who would be stricken suddenly while at play and die within a few hours.

There was a strange stillness. The birds, for example—where had they gone? Many people spoke of them, puzzled and disturbed. The feeding stations in the backyards were deserted. The few birds seen anywhere were moribund; they trembled violently and could not fly. It was a spring without voices. On the mornings that had once throbbed with the dawn chorus of robins, catbirds, doves, jays, wrens, and scores of other bird voices there was now no sound; only silence lay over the fields and woods and marsh.

On the farms the hens brooded, but no chicks hatched. The farmers complained that they were unable to raise any pigs—the litters were small and the young survived only a few days. The apple trees were coming into bloom but no bees droned among the blossoms, so there was no pollination and there would be no fruit.

The roadsides, once so attractive, were now lined with browned and withered vegetation as though swept by fire. These, too, were silent, deserted by all living things. Even the streams were now lifeless. Anglers no longer visited them, for all the fish had died.

In the gutters under the eaves and between the shingles of the roofs, a white granular powder still showed a few patches, some weeks before it had fallen like snow upon the roofs and the lawns, the fields and streams.

No witchcraft, no enemy action had silenced the rebirth of new life in this stricken world. The people had done it themselves. (Pp. 13–15)

B.

It took hundreds of millions of years to produce the life that now inhabits the earth—eons of time in which that developing and evolving and diversifying life reached a state of adjustment and balance with its surroundings. The environment, rigorously shaping and directing the life it supported, contained elements that were hostile as well as supporting. Certain rocks gave out dangerous radiation; even within the light of the sun, from which all life draws its energy, there were short-wave radiations with power to injure. Given time—time not in years but in millennia—life adjusts, and a balance has been reached. For time is the essential ingredient; but in the modern world there is no time.

The rapidity of change and the speed with which new situations are created follow the impetuous and heedless pace of man rather than the deliberate pace of nature. Radiation is no longer merely the background radiation of rocks, the bombardment of cosmic rays, the ultraviolet of the sun that have existed before there was any life on earth; radiation is now the unnatural creation of man's tampering with the atom. The chemicals to which life is asked to make its adjustment are no longer merely the calcium and silica and copper and all the rest of the minerals washed out of the rocks and carried in rivers to the sea; they are the synthetic creations of man's inventive mind, brewed in his laboratories, and having no counterparts in nature.

To adjust to these chemicals would require time on the scale that is nature's; it would require not merely the years of a man's life but the life of generations. And even this, were it by some miracle possible, would be futile, for the new chemicals come from our laboratories in an endless stream; almost five hundred annually find their way into actual use in the United States alone. The figure is staggering and its implications are not easily grasped—500 new chemicals to which the bodies of men and animals are required somehow to adapt each year, chemicals totally outside the limits of biologic experience.

Among them are many that are used in man's war against nature. Since the mid-1940's over 200 basic chemicals have been created for use in killing insects, weeds, rodents, and other organisms described

in the modern vernacular as "pests"; and they are sold under several thousand different brand names.

These sprays, dusts, and aerosols are now applied almost universally to farms, gardens, forests, and homes—nonselective chemicals that have the power to kill every insect, the "good" and the "bad," to still the song of birds and the leaping of fish in the streams, to coat the leaves with a deadly film, and to linger on in soil—all this though the intended target may be only a few weeds or insects. Can anyone believe it is possible to lay down such a barrage of poisons on the surface of the earth without making it unfit for all life? They should not be called "insecticides," but "biocides."

The whole process of spraying seems caught up in an endless spiral. Since DDT was released for civilian use, a process of escalation has been going on in which ever more toxic materials must be found. This has happened because insects, in a triumphant vindication of Darwin's principle of the survival of the fittest, have evolved super races immune to the particular insecticide used, hence a deadlier one has always to be developed—and then a deadlier one than that. It has happened also because, for reasons to be described later, destructive insects often undergo a "flareback," or resurgence, after spraying, in numbers greater than before. Thus the chemical war is never won, and all life is caught in its violent crossfire. (Pp. 18–19)

From Rachel Carson; *Silent Spring*
[Boston: Houghton Mifflin, 1962]

1. Which selection did you react to more emotionally?
2. Which selection made you more eager to do something to solve the problem?
3. Which selection better convinced you that the author knew what she was talking about?
4. Which selection gave you more ideas about how to solve the problem?

AS A CLASS

With your classmates discuss the following questions: Share your answers to the questions above. Why didn't Rachel Carson simply write a straight scientific book? Why did she also include a poetic-fictional beginning in the excerpt marked A?

ON YOUR OWN

1. In which excerpt is the problem stated specifically?
2. Using only one sentence, define the problem as fully as you can.
3. How many alternative solutions or hypotheses can you think of for solving the problem?

Reflection: Think of a time when you helped solve a problem for someone else. Perhaps you helped a family member, a friend, or a neighbor with a problem, or you contributed to an organization such as the Red Cross or UNICEF. Did you decide to help because of an appeal to your mind or because of an appeal to your feelings, or both? In your reflection journal, write a short narrative about your recognition of the problem and your decision to help.

Going Beyond

Throughout history, literature has played an important role in identifying problems common to all people and in motivating people to try to solve them. Choose one of the following authors and/or books and write a paper explaining the problem that the author described and how people were inspired to work to solve the problem.

- Charles Dickens, *David Copperfield, Bleak House, Hard Times, Oliver Twist*
- Alexander Solzhenitsyn, *One Day in the Life of Ivan Denisovich*
- Harriet Beecher Stowe, *Uncle Tom's Cabin*
- Miguel Angel Asturias, *El Senor Presidente*
- Upton Sinclair, *The Jungle*
- Kate Chopin, *The Awakening*
- John Steinbeck, *The Grapes of Wrath*
- George Orwell, *1984*
- Aldous Huxley, *Brave New World*
- Alex Haley, *Roots*
- Neville Shute, *On the Beach*
- Alan Paton, *Cry, the Beloved Country*
- Anne Frank, *Anne Frank: The Diary of a Young Girl*

Reflection: Over the next few days, keep a record in your reflection journal of the times when you feel strong emotions related to problems you or someone else needs to solve. Each time you do, note the emotion you feel and tell how it is related to the problem.

LESSON 5: Reason and Emotion in Problem Solving

In the last lesson you saw that the emotions play a very useful role in identifying problems and in motivating people to try to solve them. Once a problem is identified, however, emotions often get in the way of solving it. Emotions are particularly likely to hinder problem solving when the problem involves a conflict between two people or two groups of people.

The problem-solving model you have been using throughout this chapter can be adapted to conflicts, the most difficult kind of interpersonal problems, if you pay attention at each step to how your approach is affecting both your emotions and the emotions of others involved.

Conflicts are usually recognized by the emotions they generate. Somebody gets mad or hurt. However, the way the angry person defines the problem usually is not a good problem-solving definition. An angry person is likely to define the problem as "You dummy! I can't stand you!" or "Get your stupid junk off my desk!"

Neither of those statements is likely to lead to effective problem solving. The first step in effective problem solving is to look at the conflict in a way that will not immediately anger the other person.

ACTIVITY:

Confronting the Problem

IN A GROUP

In a group with three others, think of a conflict that a typical high school student might have with another student, a family member, or any other person. Give names to your imaginary student and the other person and discuss in some detail the situation the student might be angry about. Then make up a skit in which the student confronts the other person about that situation. Two of you will act out the skit, with the student confronting the other person in a way that is almost guaranteed to make that person angry. Then the other two will act out the same situation, but with the student describing the

problem to the other person in a way that might not make him or her angry. Practice enough that you can present your skit to the class.

AS A CLASS

Act out your skit and watch the skits of the other groups. After all skits are finished, your teacher or one of your classmates should draw a chart on the board like the following:

How to make people angry when bringing up a problem	How to avoid making people angry when bringing up a problem

As a class, think back through all the skits and list all of the techniques used both to make people angry and to avoid making them angry.

Defining a Problem from Both Points of View

In Lesson 2, you learned to define a problem with a sentence starting, "In what ways can we . . . ?"

However, in a conflict, both people usually have their own definitions of the problem, and these definitions are often opposed or incompatible. For example, John's mother might define the problem as, "How can I get John to wear appropriate, neat-looking clothes?" John, however, might define the problem as, "How can I get my mother to quit trying to tell me how to dress?" Obviously there is a conflict here, and one person or the other is not going to get the problem solved alone. In fact, in many families with similar problems, neither person gets the problem solved to his or her satisfaction. Both persons continue arguing with each other and being unhappy.

The first step in defining a conflict is understanding both points of view. This is particularly important when both people are angry.

because in anger people often communicate poorly, even with themselves. When angry, people often exaggerate their points of view and make the conflict seem much bigger than it really is. For example, John's mother, when she is angry, may sound as if she can't stand *any* of John's clothes, and John, when angry, may sound as if he wants to dress much more radically than he really does.

The most difficult—and most important—skill in resolving conflicts is listening carefully to the other person's point of view. You have already, in Unit 1, learned to look at the other person's point of view. But using that technique when you are angry requires a good deal more skill.

An effective way to be sure that you understand the other person's point of view is to try to summarize it in your own words. Say something like, "Let me see if I understand your point of view. You are saying that . . ." If you are not sure exactly what the other person is saying, ask questions. Try to make the person be more specific about vague words.

For example, John and his mother may have very different ideas of what the word "appropriate" means. John may assume that his mother is objecting to his whole personality, values, and way of life, while his mother may actually only object to a particular jacket or haircut. Asking the other person questions to clarify what she or he means is an important way of stating the problem effectively.

ACTIVITY:

Defining Problems

ON YOUR OWN

Imagine that you are in the following situations. Write down a list of the questions you could ask to find out specifically what the other person is upset about. Be sure to phrase the questions in a way that will not make the other person angry.

1. You just got back an English composition which you had worked hard on and which you thought was very good. The paper has no grammatical mistakes, but the teacher has written that "your ideas are not well developed." The grade is a C. What questions could you ask to help you understand your teacher's point of view?

2. You have been playing basketball after school with a group of friends. Today when you go by, they all look at you in a very unfriendly way and say things about not wanting to play with such a bad sport.

3. You are working after school in a record shop. Your boss tells you that she is very unhappy with your work, that you have turned out to be too lazy.

4. You ask your best friend for help figuring out why you have trouble getting dates and are told, "You're too stuck up. People think you're conceited."

Reflection: Did you have any feelings associated with the exercise? Did you find yourself feeling angry or hurt at even the imaginary situations? Would you have felt angry or hurt in real situations like these? Write a paragraph in your reflection journal describing your feelings in the exercise or the feelings you imagine you would have had in the real situations.

ON YOUR OWN

Think back to a recent conflict you have had and try to put yourself in the place of the person who was angry at or disappointed in you or your work. Write a paragraph as if you were the other person telling specifically why he or she was not happy with something you had done and what he or she wanted you to do. Start, "I am unhappy with [your name] because . . ."

Seeking Solutions

When you studied scientific problem solving, you discovered that it is useful to state the problem in the form, "In what ways can we . . . ?" In a conflict, it is useful to state the problem in the same way, but to state *both* people's goals, even if at first they seem contradictory. For example, "In what ways can John dress to satisfy both himself and his mother?" or "In what ways can John meet his own needs to fit in with his group and his mother's needs to have him look respectable to her friends?"

The way you define the problem will depend on how well you and your opponent understand it, so it is very important to look at the problem from both points of view before you try to define it. After you state the problem in this form, you can brainstorm solutions. You may be surprised to discover that quite often there is a solution that gives both people at least part of what they want.

ACTIVITY:

Finding Solutions

IN A GROUP

In a group with three other students, first state each of the conflicts below as a problem in the form "In what ways can we . . . ?" Then brainstorm as many solutions as you can think of.

1. Maggie and Heather are sisters who share a room. Maggie is interested in biology and has a pet hamster, a turtle, an aquarium, and an ant farm on her side of the room. Heather does not particularly like animals, dead or alive, and is very upset by any smells or messes. In the past week the hamster has gotten loose and wet Heather's bed, and the aquarium has leaked on her term paper.

2. Katie and Paul both work at a fast-food restaurant. Katie has been working there for several years and is interested in possibly applying for a management training program. Paul is a new employee and is working in the summer only to earn money for a car. Katie is Paul's supervisor, and she is constantly criticizing him for being sloppy, for being unpleasant to customers, for stopping work to talk to his friends, and for making mistakes on orders. Paul can't stand Katie. He says she makes him nervous and causes him to make more mistakes. He claims she is always picking on him and never notices when he does anything right.

Reflection: Look back at the list of personal and global problems you wrote at the beginning of this unit. List in your reflection journal those that you now feel better prepared to solve and briefly note which problem-solving techniques you think might help with them. Then list those that you still do not feel prepared to solve. Save this list for the next unit.

The Creative Imagination

LESSON 1: Recognizing Inspiration

Have you ever said, "I'm waiting for inspiration," when your teachers or parents urged you to begin a writing assignment? If so, you have recognized that there are special times when your mind seems to function creatively. When you feel "inspired," ideas seem to flow from nowhere and your writing probably sounds much more imaginative than usual.

For thousands of years, creative thinkers have recognized—and been puzzled by—inspiration that seems to appear suddenly out of nowhere. Poets, inventors, mathematicians, musicians, and ordinary people have all reported the experience of having an important idea appear suddenly while they were half asleep, taking a bath, or walking in the park. Some creative people find this happening so regularly that they keep notepads by their beds or bathtubs or in their pockets to record these sudden inspirations.

While inspiration has been recognized for several thousand years, until recently it has been little understood. In fact, it has widely been treated as something almost magical. The Greeks and Romans personified inspiration in the arts as the Muses, and frequently began their efforts with requests for their aid. Even today, most people treat inspiration as something unexplainable and uncontrollable. Even scientists often talk informally of inspiration as something that defies natural laws.

Alpha Waves and Beta Waves

During the past few decades however, research into brain functions has begun to provide new knowledge. We are beginning to know enough about the way inspiration works to find ways of enhancing it. Scientists have discovered, for example, that the rhythm of brain waves is different for different types of thinking. They have now labeled two quite different brain-wave patterns associated with two styles of thinking.

The first type of brain-wave pattern, labeled the *beta* pattern, produces electrical waves of fourteen cycles per second. The beta pattern occurs when people are doing normal, focused thinking, such as working math problems, taking tests, or solving everyday problems where there is an established sequence of steps to follow. When they are in the beta pattern, most people are aware that they are thinking and sense that they are deliberately guiding their minds to fulfill a certain task.

The second type of brain-wave pattern, the *alpha* pattern, produces slower electrical waves of roughly eight to thirteen cycles per second. The alpha-wave pattern is associated with meditation, relaxation, and daydreaming. When their brains are operating in the alpha state, most people are not aware that they are thinking at all. They will often say that their minds are blank. Though it seems to be out of this state that much creative inspiration comes, most people are unaware that it is a thinking process that has produced the inspiration. It is as if the thinking has occurred in some back room of the brain, hidden from consciousness—as if in this back room the mind can escape from the tracks or ruts in which it usually travels and can create new possibilities.

Because this "back-room" alpha-wave thinking is so different from the thinking patterns you normally work with, techniques to improve your skills in using it may seem a little strange. In fact, some of the techniques you will learn to use to enhance alpha-wave thinking are exactly the opposite of the techniques you have learned to improve your more familiar beta-wave skills. So the first things you need to learn are the differences between the two kinds of thinking and the situations in which each is appropriate.

ACTIVITY:

Learning to Recognize Alpha and Beta

ON YOUR OWN

Follow the directions below. As you do the activities, try to be aware of how your mind is working and how that kind of thinking feels. See how many differences you can find between the two kinds of thinking.

1. Try to reexperience in your mind either your breakfast this morning or your supper last night. Try to visualize the food and to recall particularly the tastes and smells associated with the meal.

2. Solve the following problems. You may use pencil and paper if you need to.

248 + 379 = 743 − 698 = 915 × 376 =

Reflection: In your reflection journal list all of the differences you were aware of between the two kinds of thinking. After you have listed everything you can think of, answer the following questions, which may help you to recall other differences. However, do not worry if you cannot answer the questions or are not aware of the differences the questions seem to imply. Different people notice different things about the two states.

1. Which task seemed harder? Can you describe what was harder about it?
2. In which task did you feel that you had more control over your mind?
3. Did you close your eyes or look off into space for either task? If so, can you figure out why you did?
4. Which task were you more easily distracted from? Can you figure out why?
5. Were you aware of more tension or relaxation, more alertness, or any other different sensations in your body as you did one or the other task? Were you aware of a difference in the speed of your breathing with one or the other task?
6. Which problem required alpha thinking and which required beta thinking?

Share your observations with your classmates.

ACTIVITY:

Identifying Two Types of Thinking

In the following selection, mathematician Jules-Henri Poincaré describes his thought processes as he was developing a complex mathematical theory.

OR YOUR OWN

As you read the selection, do not be distracted by mathematical terms like "Fuchsian functions," "non-Euclidean geometry," or "indeterminate ternary quadratic forms." Simply observe how Poincaré's mind worked and try to identify which parts of the process seemed to occur in an alpha state and which parts in a beta state.

Creative Thought Processes of a Mathematician

For fifteen days I strove to prove that there could not be any functions like those I have since called Fuchsian functions. I was then very ignorant; every day I seated myself at my work table, stayed an hour or two, tried a great number of combinations, and reached no results. One evening, contrary to my custom, I drank black coffee and could not sleep. Ideas rose in crowds; I felt them collide until pairs interlocked, so to speak, making stable combinations. By the next morning I had established the existence of a class of Fuchsian functions. . . . I had only to write out the results. . . .

Just at this time I left Caen, where I was then living, to go on a geologic excursion under the auspices of the school of mines. The changes of travel made me forget my mathematical work. Having reached Coutances, we entered an omnibus to go some place or other. At the moment when I put my foot on the step the idea came to me, without anything in my former thoughts seeming to have paved the way for it, that the transformations I had used to define the Fuchsian functions were identical with those of non-Euclidean geometry. I did not verify the idea; I should not have had time, as, upon taking my seat in the omnibus, I went on with a conversation already commenced, but I felt a perfect certainty. . . .

Then I turned my attention to the study of some arithmetical questions apparently without much success and without a suspicion of any connection with my preceding researches. Disgusted with my failure, I went to spend a few days at the seaside, and thought of something else. One morning, walking on the bluff, the idea came to me, with just the same characteristics of brevity, suddenness, and immediate certainty, that the arithmetic transformations of indeterminate ternary quadratic forms were identical with those of non-Euclidean geometry.

(Jules-Henri Poincaré quoted in Brewster Ghiselin, *The Creative Process* [New York: New American Library, 1952])

AS A CLASS

With your classmates discuss the following questions:

1. At which times was Poincaré probably using alpha patterns, and at which was he using beta patterns?

2. Describe in your own words the process by which Poincaré solved his mathematical problems. Consider the relationship between the work he did at his desk and the insights he had on the bus and at the seashore.

3. Poincaré describes three times when he had sudden, surprising insights. What did the circumstances of those three insights have in common? Why do you think the insights did not come when he was working at his desk?

4. Have you ever had the experience of trying as hard as you could to remember something, with no success, only to remember it later when you were thinking about something else? For example, you might have forgotten something for a test, or a person's name. Describe the experience, particularly what you remember about the environment and your mental concentration both at the time you could not remember and at the time you remembered. In which mental states did the forgetting and remembering occur?

Reflection: During the next twenty-four hours, observe the way your mind is working. Whenever you think you can identify either the alpha or the beta state, write in your reflection journal what kind of activity produced which state. Try to make a record about once every hour during your waking hours. Do not worry if much of the time you are not clearly in one state or the other.

LESSON 2: Shifting Gears

Every day, each of us shifts from alpha to beta thinking and back again many times according to the kinds of thinking required of us. The shift from one to the other usually happens automatically, like automatic transmission in a car. But many creative artists tend to prefer manual transmission—and learn to shift from one pattern to the other more deliberately.

The shift from alpha to beta waves is fairly quick and easy. You can probably recall a time when you were daydreaming in class, and all of a sudden you heard the teacher call your name and felt startled, suddenly realizing that you did not know what was going on in class—and had not even been aware that you did not know. You may have described the experience as "waking up" even though you were not asleep. Your brain usually shifts quickly and automatically to beta activity as soon as you are confronted with a problem to solve.

However, sustaining beta activity is often harder. Soon after the teacher called on you, you may have found yourself drifting off again . . . out of focus . . .

The shift to alpha is slower and harder to describe, and many people find it difficult to shift deliberately—because doing something deliberately requires beta thinking. Physically slowing down and relaxing is one way of doing it. Breathing deeply and relaxing all parts of the body will usually slow brain waves to the alpha level.

ACTIVITY:

Recalling the Shifts

ON YOUR OWN

Take a few moments to relax and recall the following situations.

1. Recall a time when you shifted from alpha to beta thinking processes suddenly and consciously. Describe the process in your own words. What were the circumstances?
2. Recall a time when you shifted from beta to alpha. What were the

circumstances? Can you recall ever making the shift deliberately? Can you recall ever trying to avoid the shift—when you were drifting off into daydreams in class, for example? What are some of the ways you try to keep yourself in the beta state?

Share one of your recollections with your classmates, according to your teacher's directions.

Developing Concentration

Concentration is the deliberate focusing of the mind on a specific task. You have probably worked hard to learn to concentrate. However, concentration on alpha tasks is very different from concentration on beta tasks, and an important aspect of concentration you may not have learned before is the ability to maintain the proper state for the task.

ACTIVITY:

Thinking about Concentration

ON YOUR OWN

Read the following selections, in which two athletes, tennis star Billie Jean King and golfer Arnold Palmer, describe the way they each develop the concentration needed for their games.

Notes from Center Court

You have to think on a tennis court. It is true that at the highest level of the game the players move to the ball and hit a particular shot pretty much by instinct. By that I mean that when I prepare to hit a shot now, I don't think of the specific way I'm going to grip my racket or consciously decide, say, to hit a backhand down the line or crosscourt, or with a lot of topspin or flat. By now that sort of thing comes naturally. . . . [But it takes] a tennis player time—a long time— to reach the point where the basic strategies of percentage tennis are more or less automatic.

To learn the whys of tennis you have to be a keen student of the game. When I was younger I never enjoyed watching tennis, except perhaps when two of the very best players were on the court. I preferred to play. But when I was in Australia Merv Rose made me sit down and watch matches all day long—that is, when I wasn't playing myself.

He would sit next to me and make me try to figure out certain things: like why players hit first services when they do, what kind of approach shots work best and why others don't work so well, and so on. I had to become aware of *why* players hit certain shots in particular situations, and this not only helped me to learn about my potential opponents, it helped me to understand my own game, too.

This is the sort of thing that can really make a difference, but you'd be surprised at the number of top juniors who, when they walk off the court, can't begin to tell you why they won or lost a particular match, or which shots worked for them and which didn't. For example, a player may spend an entire afternoon and not hit one successful passing shot, and afterward if you ask him why he didn't lob more or try hitting right at his opponent, he'll just shrug his shoulders. This is sad as well as stupid.

At the end of every match you should be able to remember everything that worked for you as well as everything that maybe didn't work so well, and at the same time, which shots of your opponent's were effective and which weren't. This is elementary. If you need to, compile a card catalog on both your game and those of your opponents. It's a simple enough thing to do, and can come in handy the next time you play somebody who gives you a hard time.

(From Billie Jean King, *Tennis to Win*, with Kim Chapin [New York: Harper & Row, 1970], pp. 149–50)

Developing the Winning Frame of Mind

Golf takes more mental energy, more concentration, more determination than any other sport ever invented.

The game calls for top physical effort, yet is played at low physical tension. You don't get fired up and full of adrenalin like a football player or a boxer. As a matter of fact, it would be fatal to get too fired up. A boxer who gets angry usually boxes better, unless he loses his head entirely; but a golfer who gets angry is bound to play worse.

There's no way to release the tensions that you acquire. Golf is not like football, where the physical collisions help you let off steam. In football, you can be a little mad at yourself for dropping a pass or missing a tackle, and then the next instant somebody barrels into you and knocks the memory right out of your mind; you find mental relief in the physical clash of combat. In golf there are no safety valves at all. You're under pressure; you're under tension; in a tournament you can feel the crowd's excitement and tension, which add to your own. Yet you have to execute every shot in cold blood, so to speak. You have to force yourself, each time you address the ball, to be calm and cool and detached, like a surgeon wielding a scalpel.

The mental approach that golf requires is a peculiar and compli-

cated mixture of abiding confidence and patient resignation, of intense concentration and total relaxation. It is not easy to explain—it is almost something that has to exist deep down in your unconscious mind—but let me try to tell you about it.

When I can afford to do it and the tournament is one that I desperately want to win, such as the Masters or the U.S. Open, I start getting ready at least four days in advance, sometimes even sooner. I try systematically to put everything except golf out of my mind. I don't mean that I want to shut myself away from humanity as if in a garret. In fact I'm happy that my wife understands that I don't; she never thinks of trying to help me by saying she'll bundle up the children and take them to grandmother's, so that she and the kids will be out of the way. I wouldn't want that at all, would be lost without the normal, everyday routines of life to lean against. I want to be able to concentrate, all right, but I don't want life to suddenly become something strange, different from my usual world.

I wouldn't want my wife to start babying me, either. I wouldn't want her to start shushing the children and cutting off the doorbell, or bringing me hot tea and aspirin every hour on the hour. If she seemed to be worried about me, all the concentration I am aiming for would vanish.

What my wife does do, bless her, is pretend that nothing is any different, that the tournament is still weeks away, that I have all the time in the world. But quietly, without my ever knowing it, she starts to insulate me from anything that would get in the way of my concentration. She doesn't talk to me, in those four crucial days before the tournament, about any problems. If the roof has sprung a leak or if one of the children seems to have developed a tooth cavity or if the butcher has sold her a bad cut of meat, I never hear about it—not until the tournament is over and done with and life is back to normalcy.

Without my being aware of it, without anything seeming to change, my wife sets herself up as a buffer between my concentration and the problems of ordinary life. She intercepts my telephone calls and puts through only those she knows will give me pleasure. She screens the mail and explains to our friends that we're not accepting any invitations. It isn't easy to do this, of course, and it's not really my nature. I'm a gregarious fellow by instinct.

But I know from experience that the ideal way for me to prepare for a tournament is to shut out as many things aside from golf as I can. It's best that I don't meet anybody. It's best that I don't read anything. I don't want to have to think very hard about anything at all during these days—not even golf. I get up in the morning when my brain decides to awake. I have a leisurely breakfast and hit a few balls. When I feel like quitting, I quit. If I feel like having lunch, I eat. I do it all by instinct, not thinking. I feel my way toward the kind of state of mind I'm seeking.

All this time something very important is happening inside me. I hardly know how to describe it. My mind, you might say, is getting cleared out. The part of my brain that deals with all the everyday prob-

lems of setting the alarm clock and driving to the hardware store, thinking about the children and answering my mail, has nothing to do. So it stops working. It quits sending out any messages about unfinished business or unanswered problems that might worry me, tighten my stomach or tense my muscles.

I'm seeking what I guess you would call peace of mind. I deliberately set the process in motion by sweeping everything else out of my brain. Then, gradually, as the days before the tournament pass, the feeling seeps down into my subconscious (or unconscious) mind; it seeps all the way down into my bones.

(From Arnold Palmer, *My Game and Yours* [New York: Simon & Schuster, 1963], pp. 52–53, 62–64)

AS A CLASS
OR
IN A GROUP

With your classmates discuss the following questions. Your teacher will instruct you whether to discuss them in small groups or with the whole class.

1. Which of the athletes probably used beta thinking more, and which seemed to use more alpha thinking? Why do the two games seem to require different kinds of thinking? What other games might require more beta thinking? Which might require more alpha thinking?
2. Compare the two athletes' methods of developing concentration.
3. What activity that you do requires concentration? Does it seem to require alpha or beta thinking? How do you develop concentration?
4. Arnold Palmer's method of concentration depended heavily on his wife. How did she help? Could the same peace of mind be achieved by one person? How?

ACTIVITY:

Shifting to the Alpha State

Most of us do not need the extreme level of concentration of a professional athlete, but all of us frequently need to use the alpha state. Below are directions for several techniques for making the shift deliberately. Your teacher will probably demonstrate one or more of the techniques in class. You can experiment with others on your own.

ON YOUR OWN

1. One of the easiest ways to get into the alpha state is listening to music. Select a piece of classical music with a tempo labeled *largo* or *adagio*. Beethoven's "Moonlight Sonata" is a particularly good choice. Sit in a comfortable spot with the room fairly dark. Try to let your body get in harmony and rhythm with the music. Try to feel relaxed and comfortable and drift with the music. Do not try to think of anything specific. Just let your mind drift with the music.
2. Practice relaxing your whole body. Sit or lie comfortably and close your eyes. Begin with your toes and tense and then relax your muscles. Slowly move up, tensing and relaxing your feet, your ankles, your calves, your knees, your thighs, your hips and stomach, your chest, your shoulders, your neck, your face, your eyes, and the top of your head. When you have relaxed your whole body, sit or lie quietly, feeling your body becoming more and more relaxed and comfortable.
3. Find your heartbeat and begin to count in time with it. Breathe in for four counts, hold your breath for eight counts, and then breathe out for four counts.

Reflection: After doing one or more exercises to reach the alpha state, write a paragraph in your reflection journal describing the results of the experience. Describe how you felt doing the experiment and tell whether you think you succeeded in getting into the alpha state.

After you complete this paragraph, list other activities or circumstances that probably help you get into the alpha state. Think of ways that you normally relax and get away from your everyday concerns. Walking, jogging, fishing, camping, listening to music, watching the clouds, or just sitting in a quiet spot are some of the activities people use.

ON YOUR OWN

Choose one of the following three projects:

1. Write a poem on a topic of your choice. Keep a diary as you write the poem and note the different mental tasks you do and your state of mind as you do them.
2. Think of a time when you have made or done something that you are proud of. Or think of a time when you wanted to or had to create something—even if you were not fully satisfied with the results. It might be a school assignment—a composition, a poem, a story, a history paper, a scientific experiment, a sewing or woodworking project, or a musical composition. Or it might be something creative you have tried to do at home—redecorating your room, rebuilding a car,

cooking a special dinner, or writing a computer program. Or it might be a social creation—a party, a program, or a community project.

Write an essay describing in as much detail as possible the thinking you did during the various stages of the project. If possible, describe the place you were and how you felt when you were thinking through the various stages. Describe how you got the idea in the first place, how you recognized and solved the various problems, and how you knew when you were finished.

3. Choose an artist or thinker whose work interests you and read as much as you can about his or her creative process. Try to identify any techniques the person used to help shift into the creative state, and observe the long-term impact of those aids. For example, was the person able to continue a full lifetime of creation, or did he or she "burn out" early?

Some people you might investigate are: James Baldwin, Gwendolyn Brooks, Willa Cather, Marie Curie, Dante Alighieri, Emily Dickinson, Albert Einstein, Martha Graham, Maxine Hong Kingston, Käthe Kollwitz, John Lennon, Loretta Lynn, Thomas Merton, Wolfgang Amadeus Mozart, Georgia O'Keeffe, Pablo Picasso, Edgar Allen Poe, Smokey Robinson, Diana Ross, Vincent Van Gogh, Richard Wagner, Virginia Woolf, Frank Lloyd Wright.

LESSON 3: Using the Creative Imagination in Writing

Creative thinking is not simply a matter of using the right state of mind for the right task. It is also a matter of the quality of thinking you do in each state. Now that you have learned to recognize the alpha state and have some idea of how to get into it, we will explore some ways of improving the quality of your thinking in the alpha state and of using it effectively in writing.

Read the following author's description of how she used the alpha state in writing a world history of women.

Preface to *The Underside of History*

This book was started during a year of retreat spent in my hermitage in the mountains near Boulder. It was a year of reading, reflection, withdrawal, a year needed to develop a deeper sense of connectedness after a very crowded life. This is the kind of book that can only be written in solitude.

The entire book was written at the hermitage, a little one-room cabin in the woods above our family cabin. The hermitage was the only place where there was mental space enough to lay out all the chronologies and all the maps of civilizations I needed to enroll in my head in order to write the history. It was the only place where there was room enough to unreel before the inward eye all the dramas of the past that the books evoked. For two years, the hermitage was bursting with images. Images of the overside of history, images of the underside, and always images of women. So many women—half the human race—and so magnificent. How could I capture and portray what I saw?

(From Elise Boulding, *The Underside of History* [Boulder, Co.: Westview Press, 1976], pp. xvii–xviiii)

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ACTIVITY:

The Alpha State in Writing

AS A CLASS

Discuss the following questions:

1. In what ways were Elise Boulding's techniques for creating the alpha state similar to Arnold Palmer's? To Billie Jean King's? In what ways were they different?

2. What aspects of Dr. Boulding's tasks seemed to require the alpha state? What role do you think the images played in her writing? Do you think that any aspects of the task of writing a world history required the beta state?

Reflection: Both Elise Boulding and Arnold Palmer found that the environment was important for developing the alpha state. In your reflection journal write a paragraph describing the environment in which you can best write an English composition, a poem, or a letter to a close friend. Tell what effect this environment has on you. Does it help produce the alpha state?

Imagery and Alpha Thinking

As you saw in the description of Dr. Boulding's writing style, an important aspect of creative writing is creating imagery, either remembering or creating mental pictures, complete with sounds, smells, and tastes. This skill is not only of great value to writers and other kinds of artists, but it is necessary for all of us in our everyday lives as we try to remember where we left something or try to visualize how we would look in different clothes. The following exercises will give you practice in using your creative imagination in two different kinds of writing.

You may find it easier to do these activities if you have someone else read the directions aloud, slowly enough for you to do each step before reading the next direction. If your teacher does not lead these activities in class, you might ask a friend or relative to help you.

ACTIVITY:

Recreating a Place and Writing a Description

ON YOUR OWN

1. Relax all your muscles, starting with your feet and moving slowly up your body to your head. When you are comfortably relaxed, picture yourself in a place where you recall feeling comfortable and in tune with the world. Imagine slowly gazing around the landscape. Then look in detail at the closer objects. Smell the smells of the place. Feel the air against your skin, and the earth and objects around you. Listen to the sounds and feel the rhythms around you. Relax and enjoy the place. When you are ready, open your eyes and come back into the present.

2. Write a poem or a descriptive essay about the place you visualized. If you need to, alternate between using the beta state for writing and relaxing back into the alpha state to look at the place again.

ACTIVITY:

Recreating Your Memories and Writing a Narrative

ON YOUR OWN

1. Recall your most interesting birthday. Try to remember how you felt at that age. Visualize your body at that time and try to see the world as you saw it then. Picture to yourself your family and friends as they were then. Picture the house or building where you were.

2. Write a short narrative describing one incident from your birthday.

Reflection: In your reflection journal, write a paragraph comparing your experience of writing in the two exercises above with your usual pattern of writing similar assignments. Note ways that this experience was similar to and different from your usual writing pattern. Compare the results. Do you like these pieces of writing more or less than your usual writing?

LESSON 4: Using the Creative Imagination in Problem Solving

In Unit 3 of this book, you explored a number of techniques for thinking through problems. Most of the problem-solving techniques you studied used everyday beta-state thinking, which works well for most problems. Sometimes, however, as Jules-Henri Poincaré described in the selection you read in Lesson 1, the solution just seems to escape you. Then, perhaps it is time to give your creative imagination a chance. Your mind works very efficiently in its everyday beta state, but it usually stays within very carefully prescribed limits; it does not do much exploring. In the alpha state, freed to a certain degree from conscious control, the mind seems to be able to explore new possibilities and look at the problem from a much different perspective. As a result, the mind can come up with all kinds of creative new possibilities, though it is usually wise to evaluate the ideas with your more practical beta mind before trying them.

The following two exercises and the reflections following them let you explore the way your mind approaches a problem in both the beta state and the alpha state.

ACTIVITY:

Problem Solving in the Beta State

ON YOUR OWN

The nuclear arms race is one of the most significant problems facing the world today. Using the problem-solving techniques suggested in Unit 3, write an essay describing the best way of dealing with this problem that you can come up with in twenty minutes of thinking. Remember to try to define the problem, look at all the alternatives, and evaluate each of them. Try to complete both the thinking and the writing in one class period.

Reflection: In your reflection journal, jot down a few sentences about your strategy for tackling the problem and writing the essay and your feelings while you did the exercise.

ACTIVITY:

Using the Alpha State to Explore a Problem

In this exercise you will use the alpha state to create images that will help you explore aspects of the problem of the nuclear arms race.

This exercise will be much more successful if someone else reads it aloud for you. If your teacher does not do the exercise in class, ask a friend or relative to read it for you.

The reader should also try to relax and follow the directions for the guided fantasy. The reader should be able to complete one set of directions before reading the next. Rhythm is very important. The reader should first relax and begin to breathe slowly, and then read the directions very slowly, with a breath in between each phrase, and a longer pause if necessary.

Creating Images: Get into a comfortable position . . . Relax . . . and close your eyes . . . Become aware of your breathing . . . As you observe your breath . . . notice it gradually slowing down. . . .

Imagine that you are going on the most extensive journey ever made into space. You will be gone for fifty years.

Look for a moment at the huge ship made of gleaming metal. Feel the platform vibrating as you climb up toward the entrance. Smell the fuel and feel the hot air rushing toward you as the engines heat up.

Now seat yourself in the rocket and prepare to blast off. As the rocket starts, feel the pull of gravity against you. Hear the roar of the engines. Then gradually relax as your body gets used to the speed, and look behind you at the beautiful planet you are leaving.

Look at the earth, rapidly growing smaller behind you—see the continents take shape, then be covered by clouds as you pass out of the earth's atmosphere. Watch the earth as it becomes a huge ball covering your window, and then gradually becomes smaller. Watch as the earth fades into simply another star and watch as you go further and further into space until you leave our solar system behind, then our galaxy, and float into the openness of space.

Now imagine that the time of the voyage has ended and you are

returning. Watch eagerly through your window as you slowly pick out the earth from the other stars, as it gradually becomes larger. Wait eagerly until you can establish radio contact and are relieved to hear the faint voice. You feel like Rip Van Winkle—you wonder what has happened in your absence. One of the first things you ask is, "Has there been a nuclear war?"

There is a long pause and you hear a buzz of voices, then a laugh. "Nuclear war? There haven't been any nuclear weapons for over ten years, and we've converted most of our other weapons into peacetime machines. We've almost completed a thirty-year program of general and complete disarmament."

Now you are getting closer to the planet and you have to give your attention to landing. Watch as you come down from space and the earth gradually becomes larger until you can recognize first North America and soon the landing site, and then you feel the intense force of gravity pulling you down. Feel the pressure in your ears and the thump as you land. Then hear the voices and cheers as you emerge. Smell the smells of earth once again—and look at the sunlight, once again filtered through the earth's atmosphere. After the cheers and the ceremonies are over, imagine that you are invited to spend the next year traveling around the planet to see how things have changed. You particularly want to find out what changes have happened as a result of disarmament. You can go anyplace on the planet you want to, talk to anyone you want to, visit any institution you want to. You can talk to ordinary people, visit governments or industry. Take as long as you want for your tour...

(Most people will want about ten minutes.)

After you have finished, gradually come back to the present and slowly open your eyes.

AS A CLASS

Take turns with your classmates sharing your images. Try to describe your images as vividly as you can. In fact, do not hesitate to elaborate if your images seem to become clearer as you talk. If you have trouble remembering, describe as much as you can, and do not be embarrassed if you either did not have any clear images in this first experiment or if you cannot remember them. At this stage do not react to anyone else's images. Your teacher or someone from the class should write a phrase on the board to remind you of each person's image. Take enough time to give everyone a chance to share all the images that she or he can recall.

If you get lost in the fantasy and do not have any images to share, that is okay. Save your experiences for the reflection discussion.

AS A CLASS

Evaluation: Now it is time to let your critical, practical beta mind take over. React to and critique the ideas that you have heard, referring to the notes on the board. Do any of the images seem possible or do they all seem just fantasies? Does the whole idea of a disarmed world seem impractical? Have any ideas come out of this experiment that suggest how the problem of the nuclear arms race might be solved?

Group Reflection: With your classmates, reflect on the experience by discussing the following questions. Notice the differences in the experiences of different people.

1. The nuclear arms activity was designed to take you through a particular pattern of creative thinking. See if you can identify which parts of the activity were designed for each of the following purposes.

a. To induce the alpha state
b. To remove your preconceptions and to get your mind away from familiar approaches to the problem
c. To create new ideas about the problem
d. To capture the ideas so they could be studied
e. To critique the ideas, sorting out the useless ideas from those which deserve further attention

2. How successful were the techniques with you? Which of the purposes did the activities accomplish and which did they fail to accomplish? Did you get lost anywhere in the imaging? If so, where and why?
3. Do you think any problems you had with the activity were the result of your inexperience or lack of practice with creative fantasy, or do you think they were weaknesses in the method itself?
4. Do you think this is a useful technique for creative problem solving? Can you think of other problems it might be used to help solve?

Reflection: Look back at your essay on the problem of the nuclear arms race. Compare the ideas you had in writing the essay with the ideas you had in the fantasy exercise. Think about your feelings doing both tasks. Now make two columns in your reflection journal and label them "Alpha State" and "Beta State." On the left-hand side of the page, write "Advantages," skip several lines and write "Disadvantages," and then skip a few more lines and write "Feelings." Your chart should look like this.

	Alpha State	Beta State
Advantages		
Disadvantages		
Feelings		

Under "Advantages," list the advantages you have seen in using this method of problem solving or the contributions that this state can make to the overall process. Under "Disadvantages," list the disadvantages or weaknesses of this state in problem solving. Under "Feelings," describe both the way you felt while working on the problem and the way you feel now that you are looking back at the solution.

LESSON 5: Exploring Meaning and Values

Have you ever had to make an important personal decision and found that there was a real conflict between what your rational "beta" mind felt was a wise decision and what your "alpha" mind wanted to do? Perhaps you made a list of all the advantages and disadvantages for a particular decision, but then had a nagging inner sense that the decision that looked wise and rational was just wrong! You may have said that you followed your *intuition*. When alpha thinking is used in decision making, it is often referred to as intuition. As you have seen from previous activities, intuition is able to put together a much broader range of ideas in much more creative patterns than can your rational mind.

However, as you probably discovered in the disarmament imaging exercise, your intuition can often make mistakes. It can come up with some rather impractical ideas that are quickly rejected by your rational mind. Intuition also can be quite confusing, because intuitive ideas usually appear as images or stories rather than in words. Sometimes they appear only as vague feelings, and you cannot even get a clear image.

The following activities will help you understand more clearly the way your intuition makes value judgments and provide you with some techniques for using that intuition more effectively in making decisions.

ACTIVITY:

Thinking in Stories

Our thinking about values is often done in stories or images. As children we are taught stories that help us learn to distinguish good from evil, authenticity from falsehood, and persistence from distraction or temptation.

WITH A PARTNER

Retell to a partner one of the stories listed below, or a story you remember vividly from your childhood. As you tell the story, notice the kinds of decisions that the hero or heroine makes, particularly in distinguishing good from evil.

Try to think of an experience in your own life that *felt* similar to that of the characters in the story. Explain how the experiences are similar and what advice the story is giving about wise choices.

- Snow White
- Hansel and Gretel
- Beauty and the Beast
- The Three Wishes
- Stone Soup
- The Mouse and the Lion
- The Goose That Laid the Golden Egg
- The Wizard of Oz
- Puss in Boots
- David and Goliath

AS A CLASS

With your classmates, discuss these questions:

In which of the stories is the "right" choice different from the answer one would logically expect from either normal perceptions or rational thought processes? For example, what would logic tell Beauty her reaction to the Beast should be? How did the successful characters know the "right" choice?

ACTIVITY:

Exploring Values by Writing Stories

ON YOUR OWN

Relax and drift into an alpha state. Think of a major decision you face in the future such as a choice of career, marriage, college. Imagine yourself making the choice that you are leaning toward now and picture your dreams coming true. Fantasize freely. Do not try to be realistic. Make your dreams come true.

Write a story about your life as you dream it would come out. You can write it in first person, as if you are looking back over your life when you are old, or you can disguise yourself with a different name and description and tell the story as if it happened to someone else.

After you finish the story, evaluate it with your rational mind. Use the following questions to guide your evaluation. You may either write the answers or discuss them with a partner.

1. What does the story show are the things that are important to you, that will make you feel successful or satisfied? Are these things indeed the things that are most important to you? Now that you are outside the story, how would you feel about knowing that this was the major achievement of your life?
2. You were instructed to make the story a fantasy and to achieve your goals whether they were realistic or not. Now re-image the story realistically, thinking through what you could realistically expect to happen in the situation you have created for yourself. How much fantasy is necessary to achieve your goals? Is your attraction to this path based on realistic expectations, or on fantasy? Does the fantasy in any way represent potentials that you have not yet developed?
3. Look back at the fantasy and visualize all of the sacrifices you might have to make of time, money, personal values, other opportunities, or relationships. Does the goal seem worth the sacrifices?

Reflection: Most people are naturally more skillful and more comfortable in either alpha or beta thinking. Now that you have done several exercises using both modes, write a paragraph in your reflection journal describing your own skill and preference. Describe which mode of thinking you do more easily and what kinds of thinking you have difficulty with. List some ways you can practice or compensate for your weaker mode.

The Larger Story

Another way in which we come to see the meaning and value of our lives and actions is by seeing ourselves as a part of a larger entity, by seeing our individual stories as part of a larger story. Myths are stories which help us to find our place in the larger story of life. Used in this technical sense, the term "myth" does not mean an unfounded fantasy, as when a critic of universities talks about "the 'myth' of higher education." Mythic stories may or may not be accurate in the historical sense. Some myths add fictitious events to actual history, or they superimpose cherished values on factual accounts. But they help us to feel that our nation, our people, or our species is something larger than our own lives and that gives those lives meaning. So there

are stories of the American struggle for freedom and commonly held values like the American Dream. Almost all cultures and nations, in fact, have myths that explain and support their important values.

ACTIVITY:

Examining Myths and Images

ON YOUR OWN

Notice how, in the following excerpts from his "I Have a Dream" speech, Martin Luther King, Jr., uses both imaging and myths to give his listeners the courage to make the sacrifices required by the civil rights struggle. If you can listen to a recording of the speech, notice how the sound and the cadence of Dr. King's voice encourages you to enter an alpha state so you can picture and feel the images he creates more fully.

[excerpt from] I Have a Dream

. . . I am not unmindful that some of you have come here out of excessive trials and tribulations. Some of you have come fresh from narrow jail cells. Some of you have come from areas where your quest for freedom left you battered by the storms of persecution and staggered by the winds of police brutality. You have been the veterans of creative suffering. Continue to work with the faith that unearned suffering is redemptive.

Go back to Mississippi; go back to Alabama; go back to South Carolina; go back to Georgia; go back to Louisiana; go back to the slums and ghettos of our Northern cities, knowing that somehow this situation can, and will be changed. Let us not wallow in the valley of despair.

So I say to you, my friends, that even though we must face the difficulties of today and tomorrow, I still have a dream. It is a dream deeply rooted in the American dream—that one day this nation will rise up and live out the true meaning of its creed: "We hold these truths to be self-evident, that all men are created equal."

I have a dream that one day on the red hills of Georgia, sons of former slaves and sons of former slave-owners will be able to sit down together at the table of brotherhood.

I have a dream that one day, even the state of Mississippi, a state sweltering with the heat of injustice, sweltering with the heat of oppression, will be transformed into an oasis of freedom and justice.

I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character. I have a dream . . . I have a dream that one day in Alabama, with its vicious racists, with its governor having his lips

dripping with the words of interposition and nullification, that one day, right there in Alabama, little black boys and black girls will be able to join hands with little white boys and white girls as sisters and brothers. I have a dream today!

I have a dream that one day every valley shall be exalted, every hill and mountain shall be made low. The rough places shall be made plain, and the crooked places shall be made straight and the glory of the Lord shall be revealed and all flesh shall see it together.

This is our hope. . . . With this faith we will be able to transform the jangling discords of our nation into a beautiful symphony of brotherhood.

With this faith we will be able to work together, to pray together, to struggle together, to go to jail together, to stand up for freedom together, knowing that we will be free one day. This will be the day when all of God's children will be able to sing with new meaning—"My country, 'tis of thee, sweet land of liberty, of thee I sing. Land where my fathers died, land of the pilgrim's pride, from every mountainside, let freedom ring." . . .

When we allow freedom to ring, when we let it ring from every village and hamlet, from every state and city, we will be able to speed up that day when all of God's children—black men and white men, Jews and Gentiles, Catholics and Protestants—will be able to join hands and sing in the words of the old Negro spiritual, "Free at last! Free at last! Thank God Almighty, we are free at last!"

Martin Luther King, Jr.
August 28, 1963

AS A CLASS

With your classmates, discuss these questions:

1. What can you tell about the historical circumstances of Dr. King's "I Have a Dream" speech from the images in the speech? What can you tell about the feelings of the people who were there from the images in the speech? What images in the speech helped the people see the condition they were in at the time?

2. How did Dr. King put the civil rights struggle into the larger story of the American quest for freedom? What historical images and stories did he recreate? What were the purposes of his quotations from the Bible?

3. At the same time that he was referring to familiar myths, Dr. King was creating a new vision. What were the images that he created of his own dream? To what extent have those dreams come true? Did his image of those dreams help make them come true?

4. Can you think of any people who have described themselves as continuing Dr. King's struggle? Does making his birthday a national holiday help to strengthen his vision for America?

ACTIVITY:

Seeing the Meaning of Our Lives

Abraham Lincoln's Gettysburg Address, like Dr. King's speech, uses rhythmic and melodic qualities of language to create the alpha state and then uses images to help the listeners put their own experiences into a larger picture.

ON YOUR OWN

Read the speech aloud, or listen to a good reader in your class read it. Notice the effects of the rhythm and sound

Address at the Dedication of the Gettysburg National Cemetery

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war; testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battlefield of that war. We have come to dedicate a portion of that field as a final resting-place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we cannot dedicate—we cannot consecrate—we cannot hallow—this ground. The brave men, living and dead, who struggled here have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember, what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion; that we here highly resolve that these dead shall not have died in vain; that this nation, under God, shall have a new birth of freedom; and that government of the people, by the people, for the people, shall not perish from the earth.

Abraham Lincoln
November 19, 1863

AS A CLASS

With your classmates, discuss the following questions:

1. How did Lincoln make his audience aware of the larger meaning of the lives of the men who died at Gettysburg?
2. As you listened to the speech, did you feel yourself as part of that same story? If so, how will being part of that story affect your decisions?

ACTIVITY:

Creating Your Own Myth

ON YOUR OWN

Tell the story of something of which you are a part which began long before your birth and will continue after your death: your family, an organization such as a church, synagogue, or mosque, an ethnic group, a community, a nation, a species, a planet. Or describe, as Martin Luther King, Jr., did, a struggle or a goal you are working toward which will last long after you. Describe the story of the larger entity from beginning to end and tell your role in it.

Reflection: Skim back through your reflection journal to review what you have learned about thinking. Summarize your main conclusions under the following headings:

1. The three most important things I have learned about thinking
2. The three thinking skills I have improved the most
3. The three thinking skills I now most need to improve
4. Techniques I can use to continue improving my thinking skills